

FLIGHT

First Aero Weekly in the World.

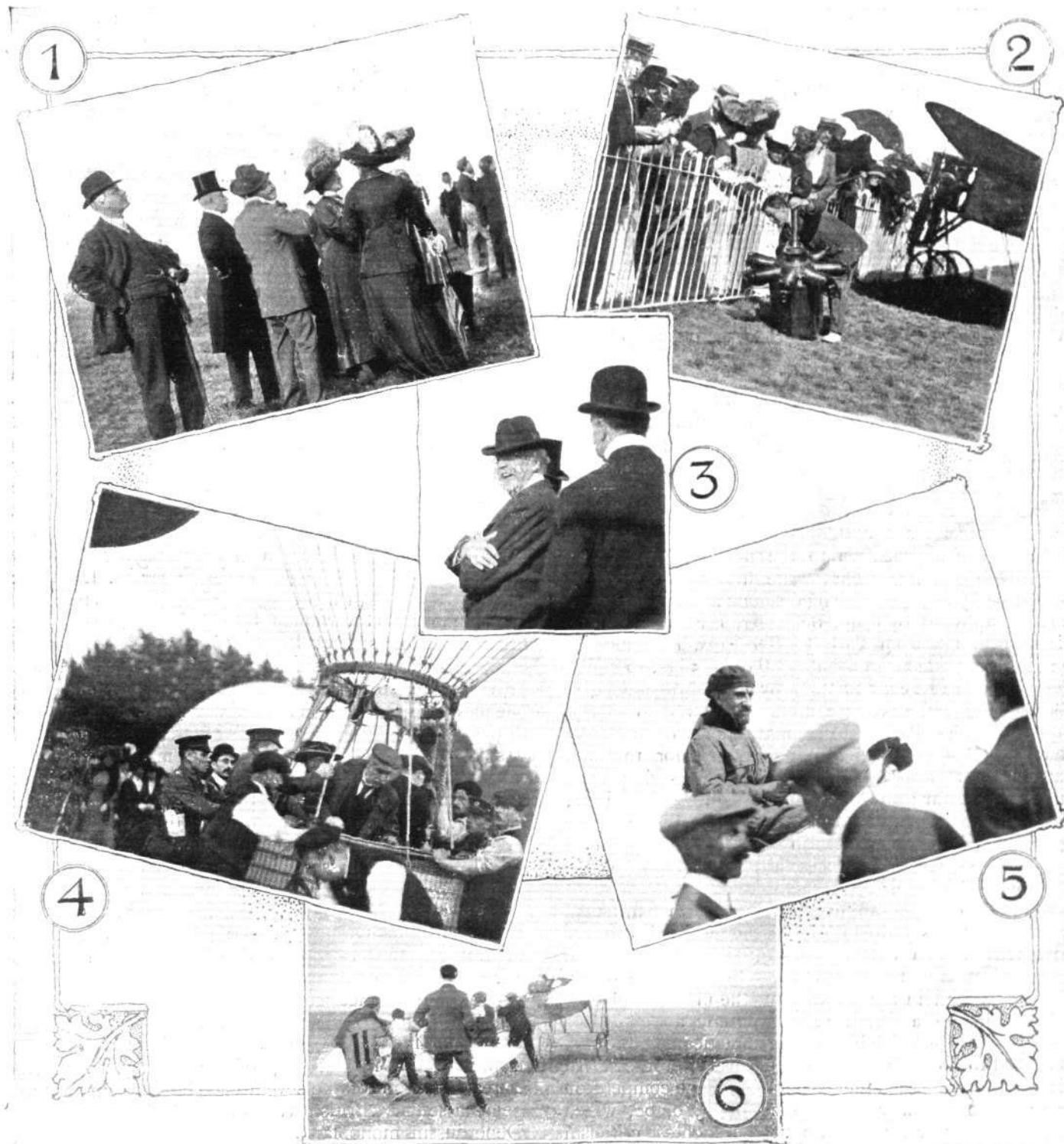
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SOME 1911 REMINISCENCES.—1. The Duke and Duchess of Connaught at the Hendon demonstration. 2. The Women's Aerial League's visit to Hendon, showing Mr. Compton Paterson, who is now flying in South Africa, explaining the working of the Gnome engine. 3. The Right Hon. A. J. Balfour after his "air baptism" with Mr. Grahame-White. 4. A balloon ascent by Mr. C. F. Pollock in the Hon. Mrs. Assheton-Harbord's "North Star" from Hurlingham. 5. Lieut. Beaumont starting for the Circuit of Britain Race. 6. Gustav Hamel just off on his Bleriot in the Brooklands-Brighton Race.

THE PROGRESS OF FLIGHT IN 1911.

THE penning of a review of the happenings in the aerial world during the year which ends to-morrow, is a far more difficult undertaking than we had realised before we embarked upon it. So much has happened, so much progress has been made, that it is hard to decide what is and what is not worthy of passing mention. Some events which were, in their time, of major importance must of necessity be mentioned once again, but the trouble is that happenings and performances which would have been of the first importance twelve months ago are merely common-place now, so far have we travelled along the path of progress.

For one thing we can be thankful, and that is that in reviewing the year we have not to look back upon a record of sadness such as fell to our lot at this time last year. True, the air has continued to exact its toll of human life, and will probably still do so until such time as it has given up all its secrets to the daring humans who essay to learn them, but the toll is a proportionately decreasing one, and while we look back with sorrow upon the fate of those who have gone from among us, we have not the same keen sense of personal loss as 1910 inflicted upon us. While we deplore the loss of human life which has been incidental to the progress of flight, we can do the dead at least the justice of believing that they have offered themselves as sacrifices on what they conceived to be their duty to science.

The Year in Detail.

The first notable event of 1911 was Mr. Sopwith's flight from Brooklands to Windsor, not a very wonderful performance in itself, but remarkable for the fact that the King manifested so great an interest in the feat that he received the pilot in person on his arrival in the castle grounds. It was a graceful act, and a tactful one, which set the Royal seal of approbation to the movement, and was fraught with encouragement for the future. In February the first really remarkable long-distance flight of the year was accomplished by Capt. Bellenger, a French military aviator, who flew from Paris to Bordeaux, a distance of 690 kiloms., in the magnificent net time of 5 hrs. 10 mins., beating the fastest express train by a handsome margin. His time, in fact, was three minutes faster than that of Gabriel in the Paris-Madrid motor-race, of unhappy memory. February was also remarkable for the fact that during this month the aeroplane was first used during actual war; an American airman, Mr. Hamilton, having flown over the town of Ciudad Juarez while fighting was in progress between the Mexican rebels and loyalist troops, returning successfully with a report of the situation in the town.

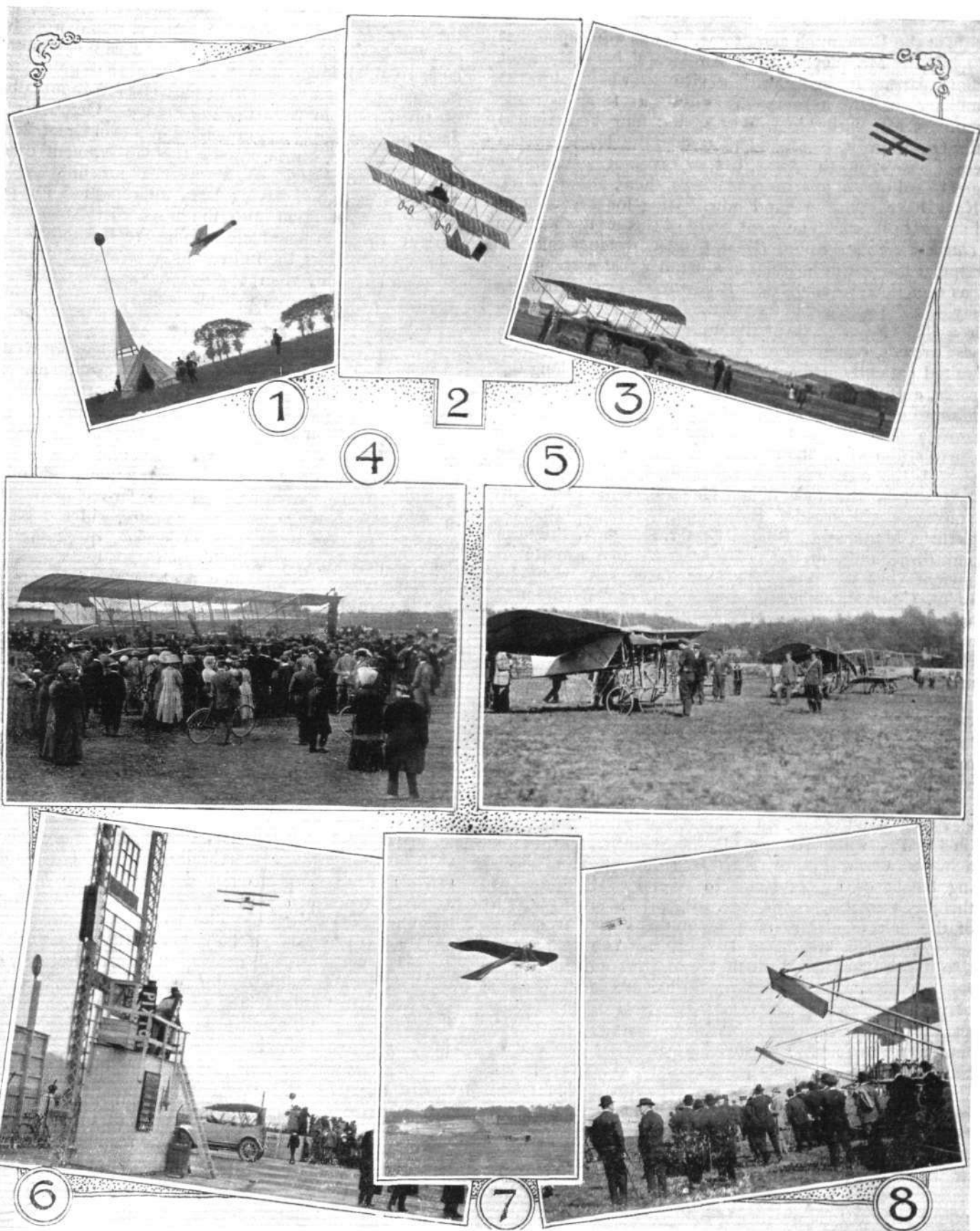
March again was an eventful month, the principal event from the standpoint of those concerned with the movement in Britain being the thorough overhauling of the constitution of the Aeronautical Society—the oldest body of its kind in the world—and the ultimate placing of its affairs on a sound basis, whereby an extremely useful institution, which had become practically moribund, was saved to do useful work for the cause of progress. In this month were issued the regulations for the competition for the second *Daily Mail* prize of £10,000, which regulations were received without the slightest criticism from responsible persons or associations. April produced one of the finest flights of the year—or, for that matter, in all the history of aviation—in the shape of Prier's non-stop flight from Hendon to Paris. The distance

is only 250 miles, which has been exceeded many times in cross-country flying, but there is a sentimental interest attaching to a flight between the two capitals which is not present in the case of the ordinary place-to-place flight. Something of a sensation was caused by the visit of quite a fleet of aeroplanes to the Thames on boat-race day. Though nothing untoward happened in connection with what was undoubtedly a daring experiment, it gave rise to a good deal of drastic criticism by a certain section of the public, and was not a little responsible for the repressive legislation which ensued at a later date, and which we shall touch upon presently. At Easter the French military authorities carried out some very successful aviation manoeuvres, from which valuable lessons were learned. Naturally our own authorities did nothing for themselves, and were not even represented officially in France.

May opened with the Brooklands-Brighton race, which had to be postponed several times on account of bad weather. This was a bad month, for in France the Minister of War, M. Berteaux, was killed by an aeroplane which got out of control at the start of the Paris-Madrid race, the Premier being seriously injured at the same time. In spite of this terrible occurrence the race was carried through at the express desire of the Premier, and resulted in a win for Vedrines, who was flying a Morane-Borel machine. In England the *Morning Post* Lebaudy brought its ill-starred career to an end by wrecking itself through colliding with a cottage, since when we have heard nothing of her or of her consort the Clement-Bayard. In this month also took place the demonstration at Hendon provided by the Parliamentary Aerial Defence Committee for the benefit of the War Office officials, who up to that time may be presumed to have been ignorant of the fact that such a thing as a practical flying machine had any existence. On this occasion Mr. A. J. Balfour ascended for a short flight with Mr. Grahame-White.

In June the Government brought in and passed the first piece of special legislation dealing with aerial craft, this naturally being of a repressive nature, and providing all sorts of penalties for real and imaginary offences against the public safety. It was rushed through hurriedly on account of the allegation that if some provision of the sort were not made there would undoubtedly be aviators flying over the Coronation processions, to the danger of the lieges. It was pointed out by ourselves, as well as others, that there was no need for panic legislation, for the simple reason that the Royal Aero Club possessed far more drastic powers of punishment than even the State itself, but protest was of no avail, and the Bill duly reached the Statute Book. In the world of competition the principal event of the month was the European Circuit, promoted by the *Standard*, in conjunction with various Continental journals. The race consisted of nine stages, British interest being concentrated on that from Calais to Hendon, and back. Of 21 competitors who started from Paris on the first stage of the journey, 10 survived to reach the end of the seventh at Hendon, among them being a solitary British aviator, Mr. Valentine, flying a Deperdussin monoplane. The race was eventually won by "Beaumont," who was later to achieve further fame by winning the *Daily Mail* £10,000 prize for the flight round Britain.

On July 1st was held the race for the Gordon-Bennett



MORE REMINISCENCES OF 1911.—1. Mr. Weymann rounding No. 1 mark post on his Nieuport monoplane in the Gordon-Bennett Race at Eastchurch. 2. A well-banked turn by Grahame-White on his Henry Farman biplane. 3. Pixton, on the Avro biplane, putting up a 1½-hr. flight for the Endurance Prize at Brooklands. 4. Graham Gilmour on his Bristol biplane at Brooklands, ready for the Brighton flight. 5. Starting line for the Circuit of Britain at Brooklands. 6. Pixton winning the Manville Aviation Prize on a Bristol biplane at Brooklands. 7. Lieut. Bier starting from Brooklands on an Etrich monoplane in the Circuit of Britain. 8. Mr. S. F. Cody arriving at Hendon from Brooklands during Parliamentary demonstration.

cup, at the Eastchurch aerodrome. It was won, somewhat luckily, by Mr. Weymann for America, flying a Nieuport monoplane. Probably with a view to waking up the military interest in aviation as well as from patriotic motives, Mr. Barber in July presented four Valkyries to the Government, two being allotted to the Navy and an equal number to the Army, but we have not heard that a great deal of use has been made of them, although the Navy have theirs in hand now, testing for their adaptability with floats. The great event of this month was the *Daily Mail* race round Great Britain, which awakened popular interest in aviation in a manner that nothing else has ever done or could do. It is scarcely exaggeration to say that the whole country went aeroplane mad for nearly a week. From early in the morning until late at night, vast crowds, composed of every class of the community, waited patiently at the principal vantage points along the route, and deemed that the trouble was well repaid by a glimpse of even one of the competitors. The movement owes a debt of gratitude to Lord Northcliffe and his organization which it will take a long time to repay. The start of the race was from Brooklands, and was divided into stages, the first being Hendon, and thence to Harrogate, Newcastle, Edinburgh, Stirling, Glasgow, Carlisle, Manchester, Bristol, Exeter, Salisbury, Brighton and Brooklands, in the order named. It is a matter of ancient history now that the race was won by Lieut. Conneau, under his *nom de guerre* "Beaumont," with Vedrines close behind and the rest absolutely nowhere. The only others to finish the course were two British aviators, Mr. Valentine and Mr. Cody, who managed to arrive before the official time for closing the competition.

August was practically devoid of any momentous happenings to be recorded, but September was quite a busy period in the realms of the air. During this month a new long-distance record was made in France by Fourry, who flew 720 kilometres, remaining in the air for eleven consecutive hours, and this was only beaten by Gobe on Dec. 24, with over 740 kiloms. Garros, at St. Malo, achieved a new altitude record by attaining the astonishing height of 13,943 feet. In several other directions this was a notable month, for it witnessed the inauguration of the first regular aerial post in the shape of a daily service between Hendon and Windsor. As a demonstration it was successful, though the aviators entrusted with the maintenance of the service had to contend with very bad meteorological conditions. September also saw the last big British dirigible, the humorously—though unofficially named "Mayfly," a gas-bag somewhat of the Zeppelin type, constructed at Barrow for the use of the Royal Navy. Defects in design had made themselves manifest, and the trials of the vessel had been postponed from time to time while these were made good. At last all was said to be ready, and the leviathan was towed out of her shed one morning for the purpose of making a trial flight. This, however, never materialised, for the unfortunate vessel, apparently without the least excuse, elected to break in half as she floated on the water. With considerable difficulty the wreck was salvaged and towed back to the shed, where it probably now lies as a monument of wasted effort and money. At any rate, it has apparently been decided to do nothing further with the vessel, for it is officially known that no effort at repair has been made up to the present. This untoward accident, coming after the wreck of the "Lebaudy," the failure of the "Clement-Bayard," and the conspicuous bad luck that seems to have pursued

the dirigible in France and Germany, would appear to seal the doom of this huge type so far as this country is concerned, although it must be noted that much more promising results have during the past few months been obtained both in Germany and France. October was a flat month so far as any important events in Great Britain were concerned, but in France the Government carried out exhaustive trials of aeroplanes for military use, a sum of £52,000 having been appropriated for prize money in connection with the tests. In America the Wright Brothers conducted some remarkable experiments with gliders, the full results of which will probably be seen later on, when the lessons learned have been applied to the power-propelled machine.

Aviation in Parliament.

If the British Government has not risen to the situation, it is not because the necessity of doing something to keep abreast of our Continental rivals has not been impressed upon them in Parliament as well as out. When at last the Government does awake to a sense of its responsibilities, it is to be hoped that the debt under which the members of the Aerial Defence Committee and other far-seeing members of both Houses have laid the country, will not be forgotten. In season and out of season, questions have been showered upon responsible ministers, but always with the same result. The policy has been the favourite one of "Wait and see" so that we have not got very much further. We have already alluded to the Bill which the Government passed in June last, so there is no need to do more than mention it in passing. It can easily be gathered that, officially speaking, the year has been a somewhat barren one.

General Advancement.

Beyond all doubt, the science of aviation has made enormous strides during the year, and we are rather at a loss to say, specifically, to what this is mainly due. Engines have been much improved, and are now vastly more reliable than they were even a short while ago. In its main lines the aeroplane itself has not departed much from the accepted types of a year ago, though, as is but natural, there has been a progressive improvement in design. For our own part, we should be rather inclined to credit the major part of the advance to the men who fly the machines. Undoubtedly, the aviator at the end of 1911 is a great deal more skilful a pilot than his predecessor of a year ago, and it must be remembered that skill in the teacher ensures skill in the pupil.

While 1911 has been a good year for the aeroplane, it cannot be said that it has been equally kind to the big dirigible. While it is true that there have not been the same number of accidents to these unwieldy craft to record that there were during the previous year, it is equally true that nothing like the same attention has been paid to the type, which appears to be somewhat discredited at the moment. At the same time, it would appear that the Germans have been carrying on careful experiments with dirigibles of a modified Zeppelin type, which have proved extremely successful as all-round craft. It may, therefore, be inadvisable to accept too readily the dictum that the dirigible has no future as a practical aerial vessel. This, however, may be said, that we have been experimenting with dirigibles for years, and that the sum total of success achieved is not a tithe of that attained in the case of the heavier-than-air type in as many months. In any event, the dirigible must always

be too much dependent upon weather conditions to make it a serious rival to other forms of locomotion.

The Government Attitude.

When we wrote our review of 1910, we recorded that that year had seen Great Britain still lagging behind the nations in the race for the supremacy of the air. This year it is necessary to go even further, and to say that, bad as our position was twelve months ago, it is infinitely worse now. Vacillation and procrastination have been the official watchwords during 1911. While France and Germany have been devoting money and brain to the perfecting of their aerial resources, we have supinely followed a waiting policy, unexampled in the history of nations and the development of aerial science for its penuriousness. What is to be thought of the state of mind which prompts the admission that we are hopelessly behind, that now is the accepted time when we really must adopt a forward policy and make a bid for the supremacy of the air, and which, in the same breath, enunciates the doctrine that it can all be done for nothing? For that is what the policy of the present Government amounts to when boiled down to its elements. Not only in its broader aspects has the attitude of the official mind towards aviation been unsatisfactory in the extreme, but in the minor details the same parsimony and cheese-paring tendency has been manifested. However, these are all matters upon

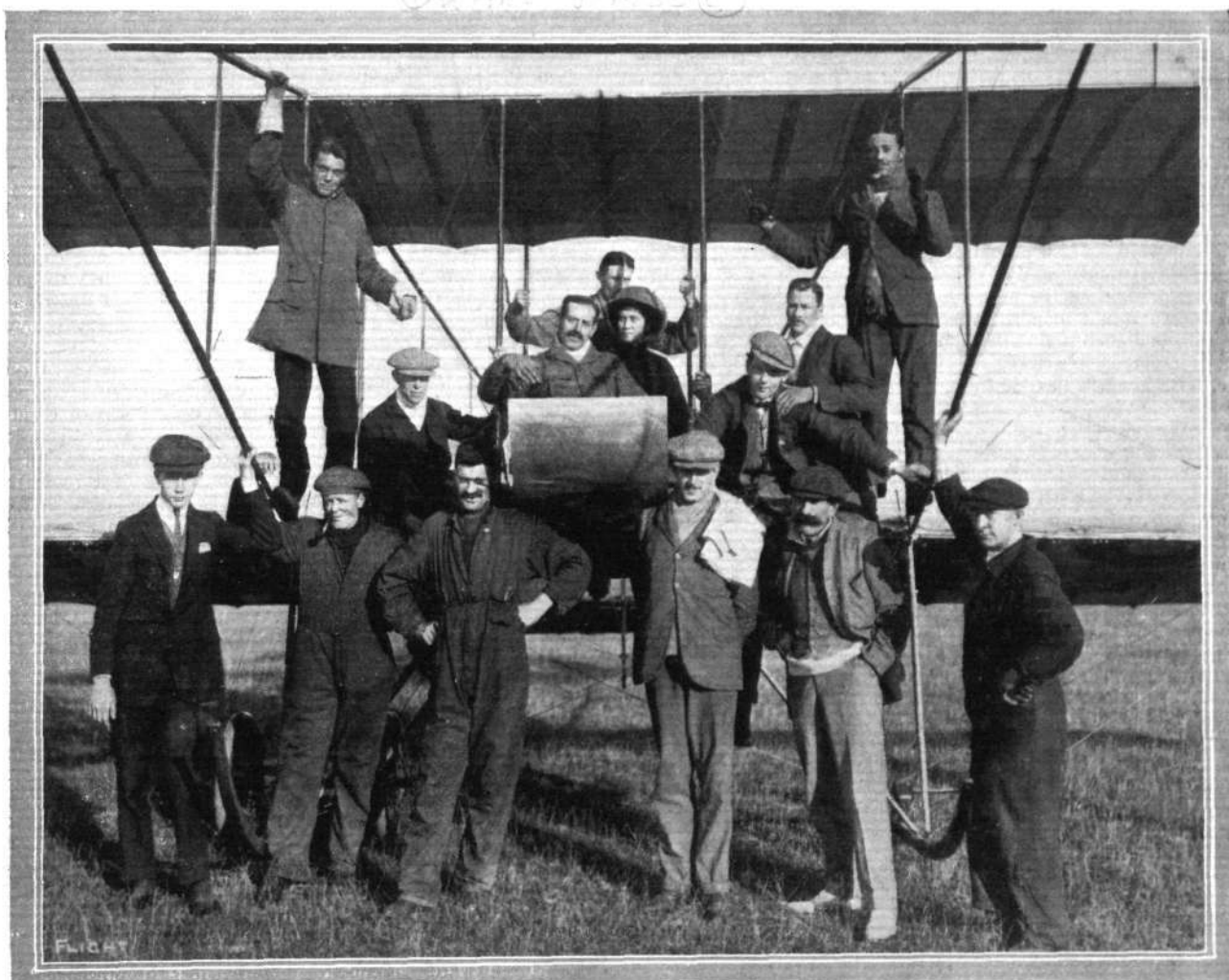
which we have commented exhaustively from time to time as occasion seemed to warrant.

There are signs that there is likely to be a tardy awakening, though in the light of experience we are not inclined to be too sanguine, but we can at least hope for better things in 1912.

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The Aeroplane on Active Service.

We do not hear a great deal of the work accomplished by the Italian airmen in the Tripolitan campaign, but what little news does filter through is convincing enough of the extreme utility of the aeroplane for reconnaissance work. The correspondent of the *Daily Express* sent home an interesting despatch the other day, describing the valuable work done by the aeroplanes attached to General Caneva's army. One conclusion is that as a bomb-dropping device the aeroplane in the hands of those employed was not successful. What it may be able to accomplish in this direction in the future of its development is another matter, but as we know it to-day and can conceive it to-morrow, we are not surprised that the actualities of warfare have taught this lesson. Of the value of the aeroplane as a gatherer of information, the correspondent speaks in the highest terms of praise. In fact, he goes so far as to say that many of the Italian operations could not have been successfully conducted had it not been for the important scouting work done by the airmen. *Verb. sap.*



A group of Bristol pilots, pupils, and assistants at the Bristol schools on Salisbury Plain. Reading from left to right (front row): Mr. O. L. Mellersh, Mr. E. Harrison, Mechanic, Mr. S. P. Cockerell, Mr. Fitzmaurice (British Embassy, Constantinople, visitor), Mechanic; top row (left to right): Naval Cadet N. F. Wheeler, Mr. W. E. Gibson, Mr. H. M. Jullerot (Chief Instructor), behind him Lieut. Wyness Stuart, Mrs. Stuart, Mr. R. Smith Barry, Lieut. R. J. Watts, Lieut. C. L. N. Newall.

"ERGAER."

DR. HANKIN'S Study of Bird Flight has been brought to a temporary conclusion, and we believe we speak for our readers as well as for ourselves when we say most sincerely that we feel great regret. Seldom, if ever, has the author of a series of technical articles succeeded in maintaining an unflagging interest throughout a mass of minutæ so ably as Dr. Hankin has done by the aid of his facile pen. Sometimes, when reading his contributions—and we have read them not once, but often—we have hardly known which to admire most, his patience and skill in making the observations or his patience and skill in making others interested therein.

We have long held the principle that no one is a complete master of his work until he can communicate his knowledge to others, and if this holds good surely we may well say of Dr. Hankin, that he is a master of masters, for not only has he the power of communicating what he knows, but he has that wonderful and so rare quality of being able to hold the reader absorbed in the least of his words. And more even than that, he has instilled into his writing something of the mystery and fascination of a well-told tale of Sherlock Holmes. Almost from the first chapter, there dawns upon the reader's mind the realisation that there is about to be disclosed some mystery of unusual interest. As the chapters progress so does the fascination in the pursuit of the unknown grow keener, but always there is the carefully-prepared argument and monumental pile of facts that the reader must digest before he is permitted to follow further the clue.

And what is it that Dr. Hankin has disclosed? he has disclosed his belief in the existence of something that he calls "ergaer" as the physical basis of soarability in air. This manifestation of energy is neither upward currents nor circular eddies nor any sort of movement of the air in mass, be the mass either great or small, and the whole of Dr. Hankin's research may be said to lead up to this outstanding statement, although, it must be admitted, it leads up to so many other things by the way that to disagree, as many doubtless will, with Dr. Hankin on this point is to detract no more from the value of his concrete bricks of information on bird flight than would the removal of a small coping stone detract from the height of a great wall.

Dr. Hankin has presented evidence amounting to proof, that soarability in the air is associated with the action of the sun's rays. Patient and prolonged observation has proved that the air is not always soarable when the apparent physical conditions are the same, and by dint of much patient observation Dr. Hankin has shown that the presence of sunlight is the only variable quantity that meets the requirements of the case. We are in the habit of saying about soaring flight that there must be a wind with an upward trend, an actual up-current, or a pulsating horizontal wind; but Dr. Hankin's observations were made when no perceptible wind existed at all and it became his particular study to find an explanation of soarability under such conditions in order to see whether the evidence of observed fact would confirm the popular and entirely logical supposition that such soarability must in reality be due to an up-current of imperceptible strength.

Now, Dr. Hankin has, at least, shown himself to be a trained observer of the very first degree. Some of his statements that are purely incidental to the article show the most profound appreciation of the disturbing influence of human nature in the practice of what is, at its best, an almost mechanical art; indeed, the minuteness to which he carries the analysis of his own powers of analysing is so uncanny as to make one wonder by what exercise of will such a free-thinking man has specialised his organs of sight and observation to form such an efficient machine.

Much as you may dislike accepting a new idea, it is at least evident to anyone who conscientiously studies Dr. Hankin's articles, that the phenomenon of soaring as practised by the birds in India is not wholly explained by any hypothesis hitherto presented. In a word, Dr. Hankin uses the term "ergaer" in reference to some principle that is not *momentum*, which principle, as Dr. Hankin says, is now the duty of scientists in general, and meteorologists in particular, to try and discover.

As a suggestion, and merely as a suggestion, Dr. Hankin remarks that this ergaer is a state of the atmosphere in which energy from the sun's rays becomes locked up in the molecular structure of the air to be released by the passage of the bird's wing. Of course, all this sounds rather like a fairy tale, but you must remember that Dr. Hankin did not start his observations with any idea of proving anything, or even with any idea that there was anything to find out at all other than what has been common knowledge from the first. He investigated, and he continued to investigate the result of his collection of observations—which is certainly more comprehensive and complete than has resulted from any previous research—was to show that the facts were not met by accepted theory in respect to the principal condition under which the manifestation of soaring flight takes place in India.

Because the idea of ergaer is new, it is not necessarily absurd; nor have we any right to dismiss it from our minds merely because we can see no immediate explanation of its cause and effect. As Dr. Hankin himself remarks, "ergaer is presented as a subject of research that has only just begun . . . the name no more implies that the matter is understood than does the name protoplasm imply that we know the nature of life."

It is mere theorising to propound notions of how ergaer is manifested, but Dr. Hankin himself suggests that it is something in the nature of chemical disintegration resulting in a continuous series of minute explosions. If only by way of emphasizing his right to have the whole subject considered, therefore, we would give as an equally plausible view that perhaps the molecular structure of the atmosphere may be modified through the electrification of the ether by the action of the sun's rays and that the energy locked up thereby may be subsequently released by an electrical charge induced by the contact of the molecules of air with the moving bird's wing.

In this connection, it is particularly interesting to refer to the experiments recently reported to have taken place in America—which we referred to in our issue of December 2nd, page 1048—where it has, apparently, been shown that the electric discharges constitute a hitherto unknown means of utilising mechanical energy in resisting gravitational force. Perhaps there is no actual connection between the two cases, but at least there is some suggestion of a connection. It does not, for example, follow that the electric discharge in the American experiments operated through the denser molecular structure of the air, it may, for instance, have been a direct etheric reaction if we assume that, basically, gravitational force is electro-etheric by nature.

Conceivably this kind of reaction, which for lack of a better term we might call radiant reaction, is also at the bottom of Dr. Hankin's ergaer, but his own observations scarcely support this idea, because they seem to imply that the manifestation takes place in the denser molecules of the air itself. Indeed, Dr. Hankin goes so far as to suggest that the explanation of the many unaccountable puffs of wind that are of daily occurrence in that part of the country may ultimately be traced to this same source.

On the suggestion provided by the American experiments, it seems logical to argue that if machine-made radiant energy will resist gravity, then sun-made energy of the same character is potentially capable of exerting the same opposing force, provided always that means are available for releasing it. Dr. Hankin's observations lead him to suppose that this energy becomes latent in some modification of the molecular structure of the atmosphere, and that it is released by the passage of the bird's wing. Considering the nature of the wing's surface, which is certainly not calculated to convert motion into heat by friction, we are led to make the suggestion that the basic nature of its influence is *electrical*, and from that starting point a very natural line of thought leads round once more to the American experiments.

In any case the speculation is undeniably fascinating, though it is equally inconclusive from a scientific point of view. Nor, when you come to think of it, is this fundamental conception of ergaer so at variance with other well-known phenomena as to be altogether lacking in reason. Who does not know, for instance, that there is a very real difference between the atmosphere of a room that gets plenty of sunlight and one that is always in the dark. A room that gets no sunlight is never the same place to live in as one that gets plenty, although it may be equally airy in other ways. Or again, who has not experienced the difference between the atmosphere of a place that is heated artificially by some circulating system and another in which an open fire is the source of warmth. Heat without light is not the same thing as heat with light so far as its influence on the atmosphere is concerned, and one of the most significant passages in the whole series of Dr. Hankin's articles is that in Chapter XXXVII in which he distinctly describes the formation of air eddies by heat without sunlight, and their influence on soarability as compared with the conditions that prevail when the sunlight is present. He shows that these eddies, which he calls sun eddies and earth eddies, "though different in origin are, when formed, one and the same. They merely differ because I have given them different names. The presence of earth eddies does not cause soarability. Therefore the presence of sun eddies *per se* does not cause soarability."

In other words, Dr. Hankin marshals his evidence to show that it is the presence of the *sun* and not the eddies that determines the soarability of the air, just as it would be within the power of anyone to bring forward evidence to show that it is the presence of the *light* and not the warmth that makes the atmosphere of a room good to live in. And, even when we get that far, there is yet one other step that few people will deny us the right to take, which is that of all kinds of light sunlight is the best.

Dr. Hankin, we are pleased to say, is coming to England very shortly, and he has promised the Aeronautical Society a lecture on "Bird Flight." We can well believe that every reader of his articles, who is also a member of the Society, will make more than an ordinary point of being present to welcome one who, whatever may be the judgment of posterity on the value of his "Ergaer," must at

least go down to history as the greatest student of bird flight up to his time.

Nor is there any doubt that his monumental labour of love, which was first sent to us as "Letters on Flight, by Vetlianka," has already become, and must for a long while remain, the classic work on the subject.

TO FLY ACROSS THE ATLANTIC.

FOLLOWING an interview with Mr. James V. Martin, the Harvard aviator who, it will be recalled, learnt to fly at Hendon, and carried the first passenger in heavier-than-air craft from Hendon to Weybridge last May, we are able to give some very interesting points in regard to the trans-Atlantic aeroplane trip which he hopes to attempt during 1912.

Mr. Martin says that the trip will be made from New York or Boston, stopping at St. John's, Newfoundland, for fuel. The oversea flight from St. John's to Ireland will be about 2,000 miles, and will be made in the month of August, when the meteorological conditions promise to be most favourable for the trip. The winds are relatively light and move in the direction of the proposed flight, so that several hundred miles of progress in the right direction will, in all probability, be due solely to the north-westerly breezes prevailing during midsummer.

The aeroplane will have a small cabin, 6 ft. wide and 10 ft. in depth fore and aft, and will provide accommodation for two operators and one mechanic.

The trip will be in charge of one of the most skilful among the younger class of master mariners, Mr. James V. Martin, who has navigated vessels in all parts of the world, and who has crossed the North Atlantic Ocean sixteen times. He is now a Research Student in Navigation at Harvard University, on leave of absence, and is an aero-pilot of the Royal Aero Club of the United Kingdom.

Little difficulty is anticipated as to the navigation. A compass will be used but not relied upon to any considerable extent, because the element of leeway in aeroplanes may be so great as to render the compass entirely misleading. Mr. Martin will have a special table of azimuths worked up for the voyage, and he will use an

instrument, provided by R. W. Wilson, Professor of Astronomy at Harvard, for determining latitude and longitude.

The average height at which the machine will remain during its trip will be 5,000 ft., and the navigator believes that he will be able to keep some vessels within sight at all times. The speed of the aeroplane will be 50 miles per hour and 40 hours are allowed for the trip.

Signalling devices will be carried by the aeroplane so that the attention of passing vessels can be attracted in case the aeroplane alights on the water.

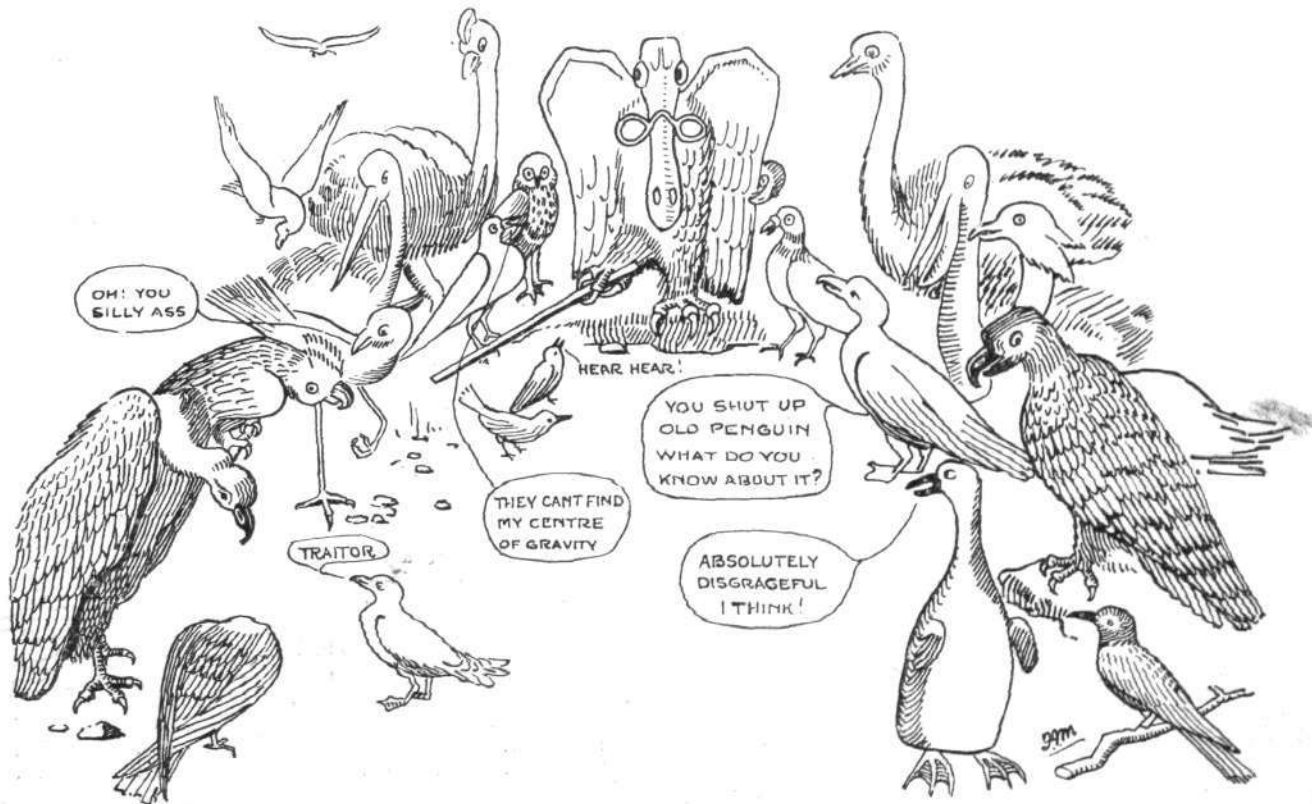
A moonlight period will be selected and a period when the wireless reports from vessels little or no percentage of fog.

The aeroplane will resemble the "Queen-Martin" headless tractor biplane in its general lines, being of course much larger and having two tractor screws geared down 50 per cent. and driven by five 50-h.p. Gnome engines which can be started at will by a disc-friction clutch. The aeroplane will have an extreme span of 100 ft. and a cord of 10 ft. and is expected to carry 5,000 lbs. of petrol and oil.

All five engines will be used to start the machine with its load, and get it clear of the water on which it rests on a specially-designed float, but when sufficient altitude is attained only four engines will be utilised, until the consumption of oil and petrol lightens the machine sufficiently to require only three engines.

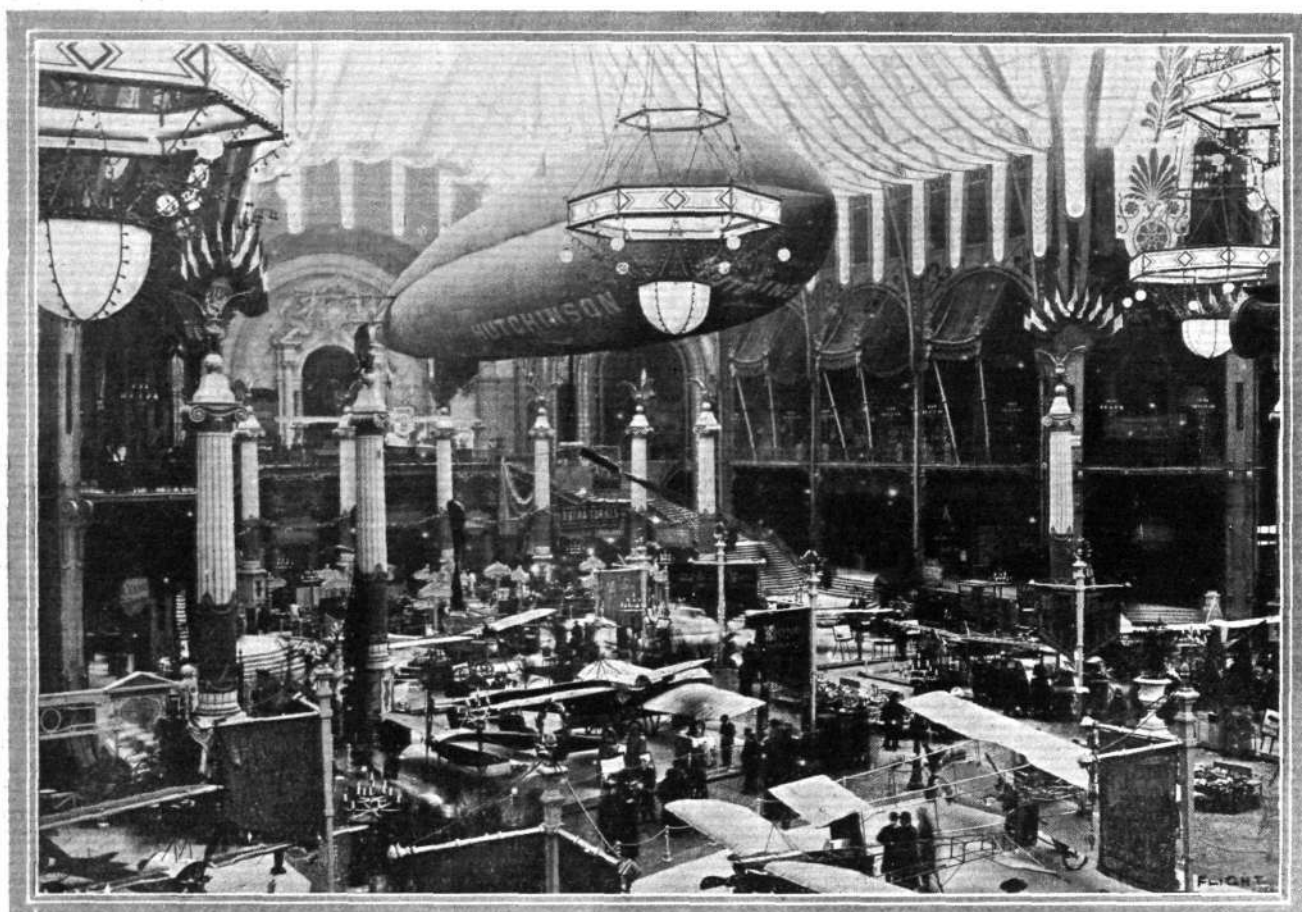
Should adverse winds keep the aeroplane back, it is proposed to have a mother ship stationed about 700 miles from the Irish coast in the line of flight, and if the sea is not extremely rough no difficulty need be experienced in renewing by hose connection the air-craft's supply of fuel.

BIRD "LAW"—A RESULTANT OF THE PUBLICATION OF DR. HANKIN'S SERIES OF ARTICLES ON BIRD FLIGHT.



A VOTE OF CENSURE.—Quoth the Judge: "After preserving our secrets through countless ages, you have basely been tempted to betray them to man. You have even gone so far as to show him how to catch a piece of bread. Remember! that when the time comes that man catches pieces of bread, and we are robbed of our livelihood, on you! on you alone, dreadful birds, will rest the blame!"

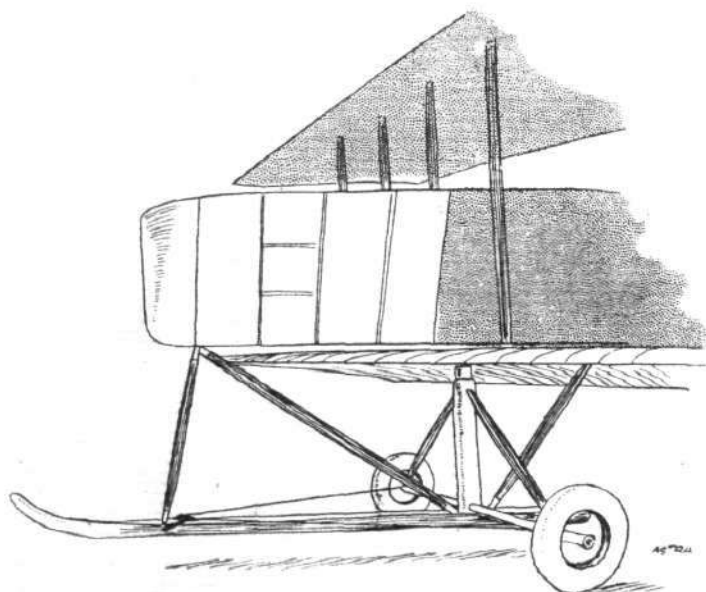
PARIS AERO SHOW.



PARIS AERO SALON.—Another general view, showing the Astra-Torres dirigible. The Roger Sommer exhibit is to the front of the photograph, while behind it is the Nieuport stand.

Astra.

THIS interesting three-seater tractor biplane, which made its appearance in the French aviation arena just prior to the Military Trials at Rheims, gives me an impression of immense strength, solidity, and power when compared with those light speed craft



Front of the Astra biplane, showing the general disposition of the under-carriage.

which form such a great percentage of the exhibits at the Salon. Its fuselage, which is divided and made detachable for convenience of transport at a point to the rear of the pilot's seat, is triangular in section, and built throughout in ash, with the exception of the forward portion, which is cross-strutted with drilled-out steel struts

of \square section, so provided to strengthen the body to withstand the extra strains imposed upon it by the motor—a 100-h.p. six-cylinder Chenu. This latter drives an 8-ft. Astra tractor screw through reduction gearing. Radiators for the cooling of the motor are disposed on each side of the body in the neighbourhood of the middle seat.

The main planes, double surfaced, are built up cellular fashion and are so constructed that they may be detached, leaving a centre section about 7 ft. in width in order that the machine may be easily transported along the road.

Warping is employed for the correction of lateral balance, this being carried out on the Wrights' system, under whose licence the Astra machines are made.

The landing gear is somewhat reminiscent of Antoinette practice, and has the triple advantage of being simple, strong and presenting little head resistance. Landing shocks are taken by a large diameter Oleo pneumatic spring that forms the centre unit of the chassis. In common with many other types of landing gear at the Salon, no provision has been made to relieve any strains resulting from a sideways movement of the machine on landing, and the fact that so many designers are apparently ignoring this detail, which has hitherto been deemed a most important one, seems to demonstrate that the constructional difficulties of obtaining this accommodation for sideways strains altogether outbalances any advantages that might accrue from its adoption.

Command is maintained over the controlling surfaces from duplicated controls arranged for the use of the occupants of the two rear seats. The duty of the occupant of the forward seat is to act as observer and for this purpose he is most conveniently placed.

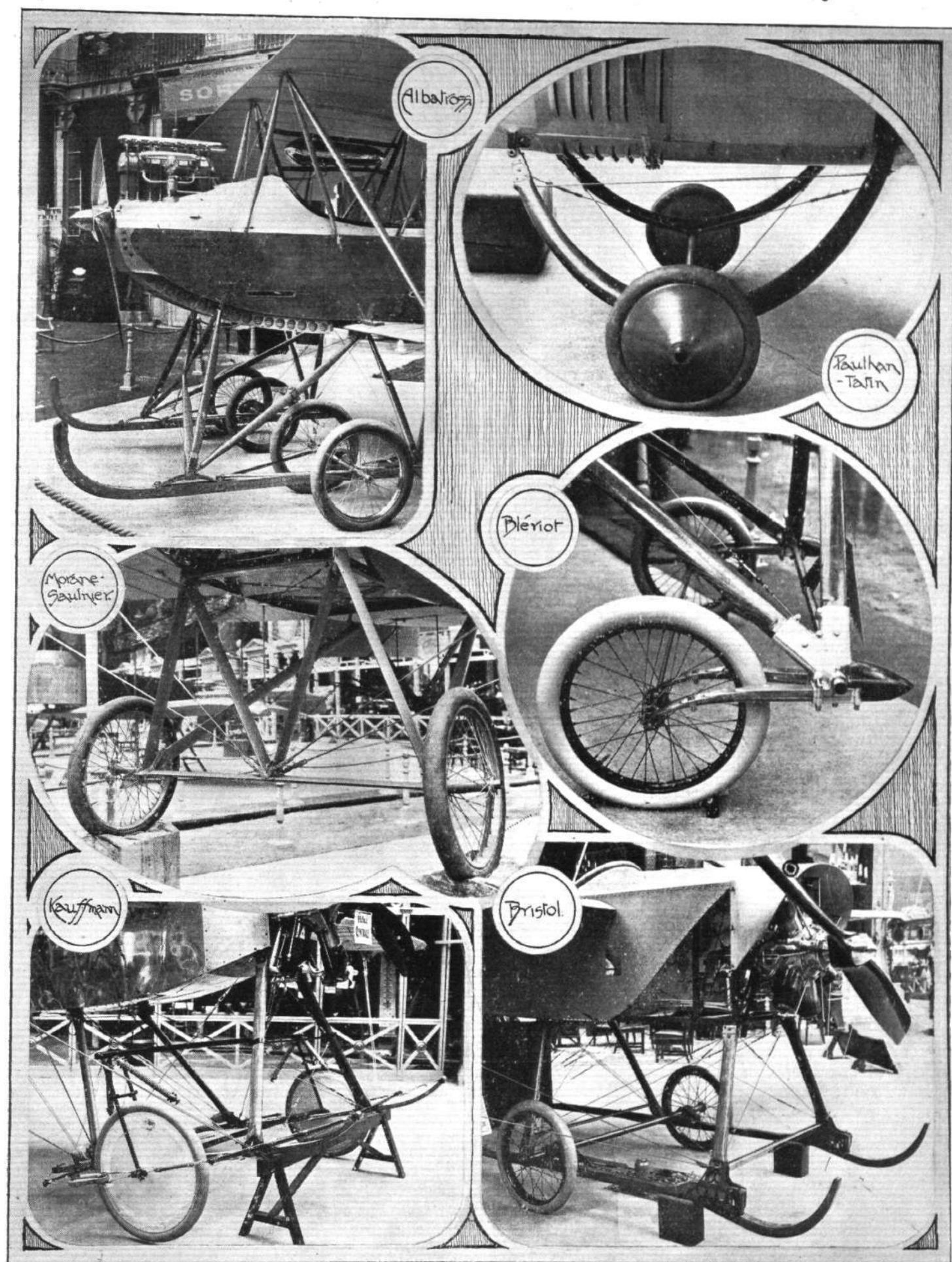
There was also exhibited on the Astra stand a dirigible nacelle equipped with two Chenu motors, each of 100-h.p.

Principal dimensions, &c. :—

Length ...	36 ft.	Weight ...	1,540 lbs.
Span ...	40 "	Speed ...	56 m.p.h.
Area ...	528 sq. ft.	Motor ...	100-h.p. Chenu.
Price ...			£1,120.

L. Blériot.

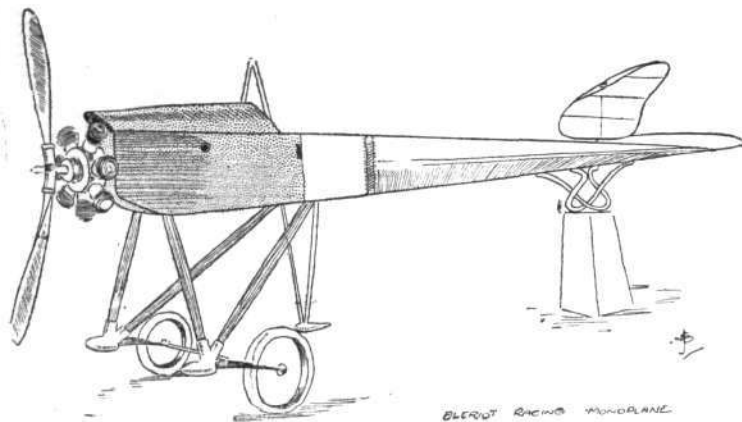
FOUR monoplanes are on view on this stand, the 70-h.p. two-seater, which Hamel has popularised in England, the familiar



Six types of landing gear at the Paris Aero Salon.

50-h.p. cross-country model, a new 50-h.p. racing monoplane, and a new low horse-power monoplane, type XXVIII, designated the "Popular" type. Of these machines we are already familiar with the former two, and no description of them is necessary.

As far as neatness and soundness of design, and excellence of workmanship are concerned, the new 50-h.p. racing model could give points to any other machine in the Salon. The fuselage, which is tapered off towards the front to reduce head-resistance, is splayed out at its rear end, after the manner of the 70-h.p.



Sketch of the new 50-h.p. Blériot racing monoplane.

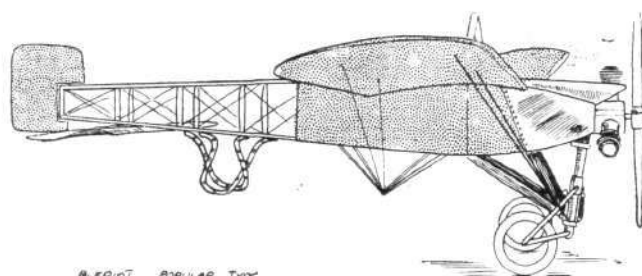
two-seater, to form a flat stabilising tail. The elevator is semi-elliptical in shape and is hinged to the rear of the tail surface. Contrary to customary Blériot practice, the engine is not supported on both sides of its crank case, but protrudes from the front of the fuselage, a system which allows of great neatness of mounting and greater accessibility to the engine. Blériot, too, has altogether gone away from the design of landing chassis to which he has so faithfully adhered since long before his cross-Channel flight. In the new type the two wheels are each supported by a pair of laminated steel springs, and only four struts are employed to attach the system to the fuselage. Its simplicity and neatness must appeal strongly to those who have given any thought to the subject of chassis design. One failing it has, however, and one which could be very easily overcome is that no side-play of the landing wheels is provided for. In this machine the controlling lever is no longer provided with the aluminium dome from which it originally derived the name of *cloche*, but is made to operate the wing-warping and the elevator through an extremely neat system of chains and chain-wheels. The bottom pylone, from



The new "Popular"-type Blériot equipped with a Y-type 35-h.p. Anzani motor.

which the wing-warping is actuated, is constructed of two steel tubes of oval section, through which pass the wires connecting the mechanism at its base to the controlling-lever. A notable point about the design of the machine is that as much head resistance as possible is eliminated, and to this end not only has the design of the fuselage and landing chassis received special study, but several parts which would normally present a flat surface to the relative wind have been enclosed by stream-line shapes of wood. Tested over the sands at Hardelot, with Leblanc at the lever, this machine has developed a speed of 80 miles an hour, and on this account we are expecting to see it figuring largely in next season's meetings.

The new single-seater "Popular" type of machine, as its name infers, should also become widely known during the forthcoming



The new "Popular"-type Blériot, fitted with 35-h.p. Y-type Anzani motor.

year for, while it is capable of fairly extended cross-country flying, it is inexpensive in initial cost and upkeep. The landing-carriage is applied to the bottom of the fuselage, a feature which not only diminishes its weight and head resistance, but reduces the overall height of the machine to something under 7 ft. From the pilot's point of view, the machine possesses the advantage over the ordinary school type, that the fuselage in front of him is totally enclosed, thus preventing any oil from being thrown back over him by the engine. A section of the floor of his cockpit is left uncovered, so that he is capable of seeing the ground immediately beneath him.

Principal dimensions, &c. :—

Popular type—

Length ...	25 ft.	Weight ...	—
Span ...	29 „	Speed ...	50 m.p.h.
Area ...	—	Motor ...	35-h.p. Anzani.
Price ...	£472.		

Cross-country type—

Length ...	25 ft.	Weight ...	528 lbs.
Span ...	29 „	Speed ...	60 m.p.h.
Area ...	165 sq. ft.	Motor ...	50-h.p. Gnome.
Price ...	£860.		

Racer type—

Length ...	21 ft.	Weight ...	500 lbs.
Span ...	23 „	Speed ...	80 m.p.h.
Area ...	132 sq. ft.	Motor ...	50-h.p. Gnome.
Price ...	£960.		

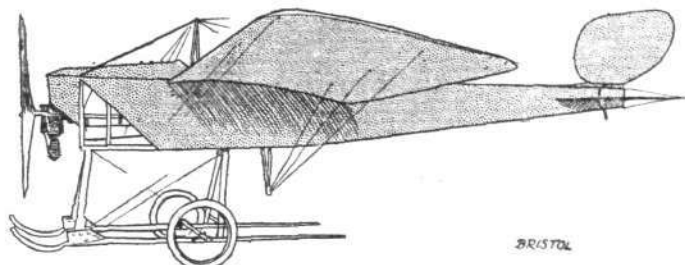
Military type—

Length ...	27 ft.	Weight ...	726 lbs.
Span ...	36 „	Speed ...	60 m.p.h.
Area ...	275 sq. ft.	Motor ...	70-h.p. Gnome.
Price ...	£1,200.		

British and Colonial Aeroplane Co.

OCCUPYING one of the central stands in the Salon was the Bristol two-seater monoplane, a thoroughly worthy example of British enterprise, design and workmanship. As far as excellence of finish was concerned, although there were many machines in the show which were perfection in this respect, none could be said to be superior to the Bristol. In its main features the machine presents little difference from the monoplane described in these pages some few weeks since, although naturally being a passenger-carrying machine, it is somewhat larger all round. Passenger and pilot are seated in tandem, the passenger being seated approximately over the centre of pressure. The landing carriage is a greatly improved A-type wheel and skid construction, possessing natural advantages of strength, simplicity, and neatness. A great improvement that the Bristol Company have effected in this type of landing-gear is the extension in a backward direction of the skids. These extensions are in length some 3 ft., and are composed of several super-imposed strips of wood, forming in effect a laminated spring. They take the place of a tail-skid, and serve to rapidly bring the machine to

rest after a landing has been made. One interesting little detail that the writer noticed, one that is typical of Bristol thoroughness, was the self-locking screw-on hub caps of the landing-wheels, which have replaced the much less mechanical method of attaching such organs by means of washers and split-pins. Mounted at the front of the fuselage is the power unit, a Gnome engine of 50 h.p. driving a Bristol propeller, the former being fed by Zenith carburettor, a practice which is steadily coming into favour in France. Surrounding the passenger are quite a number of useful accessories to help him in his observation



Side view of the Bristol two-seater monoplane.

work. There is a map roller, compass, thermos flask, field glasses, and a small writing tablet. The seats themselves are attached in a very interesting manner, they being supported from the main framework by steel wires in tension, a feature which allows them to be adjusted for the personal convenience of the occupants, and ensures safety against bodily damage that might be caused by broken splinters in case of a smash. At the Salon considerable interest was manifested in the machine, which had become widely known because of its flight over Paris, with Valentine at the lever, on the Thursday preceding the opening.

Principal dimensions, &c.

Length ...	23 ft.	Weight ...	650 lbs.
Span ...	34 ft.	Speed ...	65 m.p.h.
Area ...	200 sq. ft.	Motor ...	50-h.p. Gnome.
Price ...	£950		

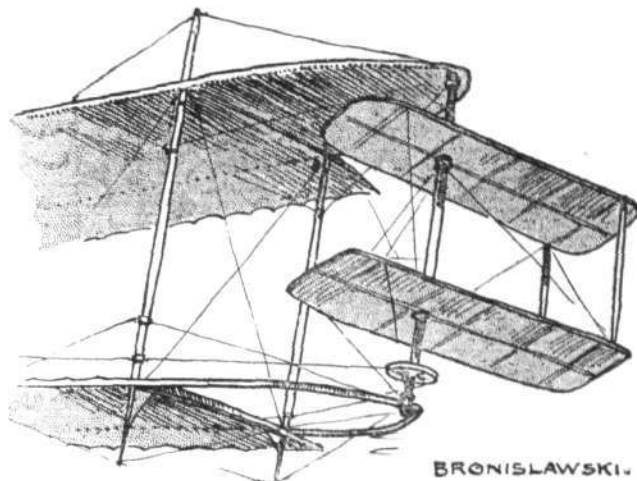


The Bristol stand—the sole representative of Great Britain—at the Paris Show. It was on a machine of this type that Valentine carried out his daring flight over Paris two days before the opening of the Show.

Bronislavski.

On this stand was exhibited a Henry Farman biplane fitted with the new Bronislavski method of balancing. This system consists of a pair of cambered planes set at a positive angle of incidence and rigidly mounted to a vertical mast, which is supported from the main planes by a skeleton of steel tubing. One of these units is situated at each end of the *cellule*. In normal flight these supplementary planes are arranged in end-on aspect to the relative wind, but as soon as the machine is tilted out of the horizontal in a lateral sense these planes are rotated about their vertical axes by means of wires passing from the pilot's controlling lever to a drum attached to the bases of their respective masts. By their rotation,

the planes become incident to the relative wind and thus lift or depress according to whether their incidence is positive or negative. Both systems of planes at either end of the main supporting surfaces work in conjunction, thus forming a righting couple. As one of the most important features of this system, the inventors claim that in the



The Bronislavski system for lateral stability as applied to a Henry Farman biplane.

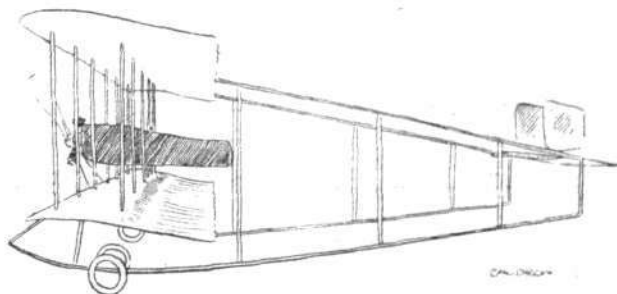
action of restoring balance the position of the centre of resistance of the machine as a whole is not altered, so that there is no necessity to bring the vertical rudder into action, and on this score they claim that the Wright patents are not infringed.

Caudron Biplane.

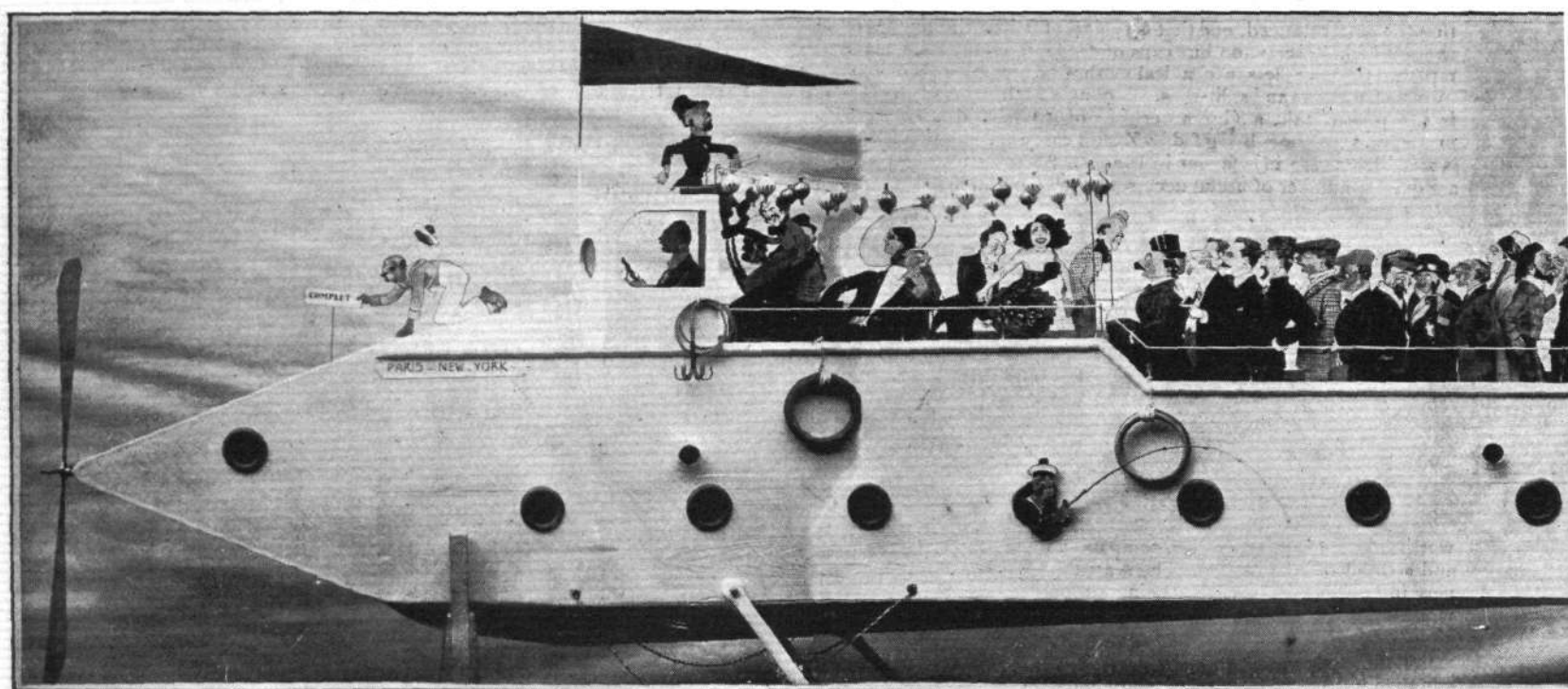
MUCH interest attaches to the little Caudron biplane by reason of its diminutive size and the simplicity of its construction. The machine in question is fitted with one of the new "Y" type Anzani engines and is capable of a speed somewhere in the neighbourhood of 55 miles per hour. A certain degree of automatic stability in a lateral sense is obtained by the method of construction of the planes. The rear-boom of the plane is situated only two feet behind the entering edge, and the remainder of the plane that extends for a distance of 2 ft. 6 ins. behind the rear boom is formed by the application of a single surfaced covering over flexible continuations of the ribs. Landing carriage and tail outriggers are combined in this little machine, and in this way much multiplicity of parts is done away with. A little body is provided for the accommodation of the pilot midway between the main plane, and at its forward extremity is mounted its power plant. A single monoplane surface performs duty as both stabiliser and elevator, elevation being effected by flexing the rear half of this surface which is constructed after the same manner as the main planes. Two vertical rudders, working in parallel, provide means whereby steering is done. This handy little machine is listed at £320 and at this price should find many customers.

Principal dimensions, &c.:-

Length ...	22 ft.	Weight	500 lbs.
Span ...	24 ft.	Speed	55 m.p.h.
Area ...	220 sq. ft.	Motor	35-h.p. Anzani.
Price ...	£320		



The diminutive Caudron monoplane, fitted with 35-h.p. Y-type Anzani motor.



A creation by "Mich," the great French humourist, at the stand of the Continental Tyre and Fabric Co. at the Paris Aero Salon, M. de Fouquières; Tootit, la Belle Otero, Fragon, Mayol, Mistinguett, Dranem, Juchmés, Mallet, Breguet, Gen, Roques, Godart, Henri de Rothschild, Comte Récopé, Duc Dezazes, Henri Desgranges; in the ring, Tristan Bernard, Johnson and Cuny; Henr

Deperdussin Monoplane.

In order to exhibit their four types of monoplanes most effectively, the Deperdussin firm went to the extent of engaging two stands for that purpose. On one stand, situated under the centre dome of the Grand Palais, were exhibited the 100-h.p. Gnome-engined three-seater monoplane and the 50-h.p. single-seater cross-country machine. At the further end of the Show was the other stand, on which the 35-h.p. Anzani-engined popular and the 70-h.p. two-seater military-types were exhibited. Very little need be said of these excellent machines, as, in the main, they do not differ from the Deperdussin monoplane, as has already been described in FLIGHT, and demonstrated practically in England by such pilots as W. H. Ewen, Lieut. Porte and Gordon Bell, and on the Continent by such men as Prevost and Védrières. The latter model—the 70-h.p. military monoplane, however, is a new one, but its only difference lies in the fact that passenger and pilot are arranged tandem fashion in the fuselage in such a way that the former is so far forward that he can obtain an excellent view of what is directly beneath the aeroplane by glancing over the front of the wings. The

Single-seater military—

Length ...	25 ft.	Weight ...	550 lbs.
Span ...	29 "	Speed ...	65 m.p.h.
Area ...	264 sq. ft.	Motor ...	50-h.p. Gnome.
Price ...	£920.		

Two-seater military—

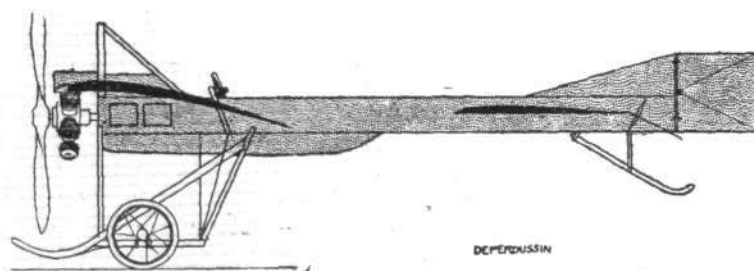
Length ...	26 ft.	Weight ...	924 lbs.
Span ...	36 "	Speed ...	65 m.p.h.
Area ...	310 sq. ft.	Motor ...	70-h.p. Gnome.
Price ...	£1,080.		

Three-seater military—

Length ...	26 ft.	Weight ...	1,000 lbs.
Span ...	43 "	Speed ...	65 m.p.h.
Area ...	350 sq. ft.	Motor ...	100-h.p. Gnome.
Price ...	£1,820.		

Farman Frères.

ON the Farman stand were exhibited two machines, one a Maurice Farman biplane and the other the new Henry Farman



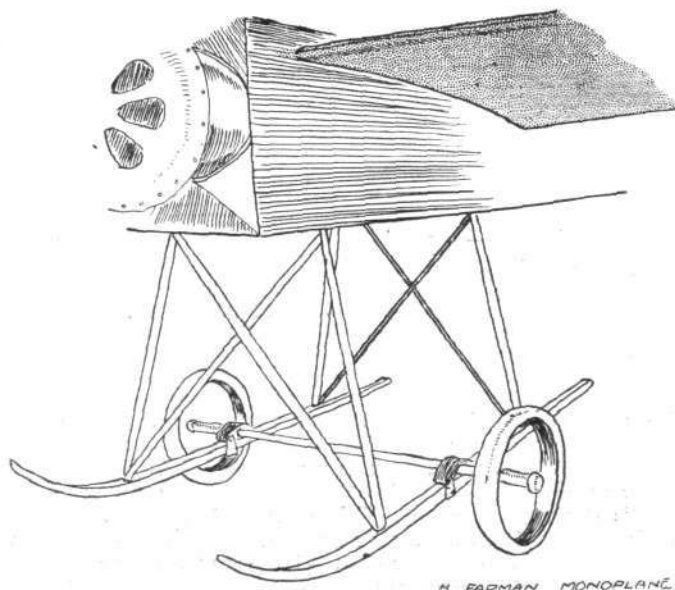
The 50-h.p. Deperdussin racer.

importance of this feature for military requirements is readily apparent. Both in design and workmanship the machines are of the highest order, and reflect great credit on the Deperdussin firm, and more particularly on the firm's designer and works manager, M. Béchereau.

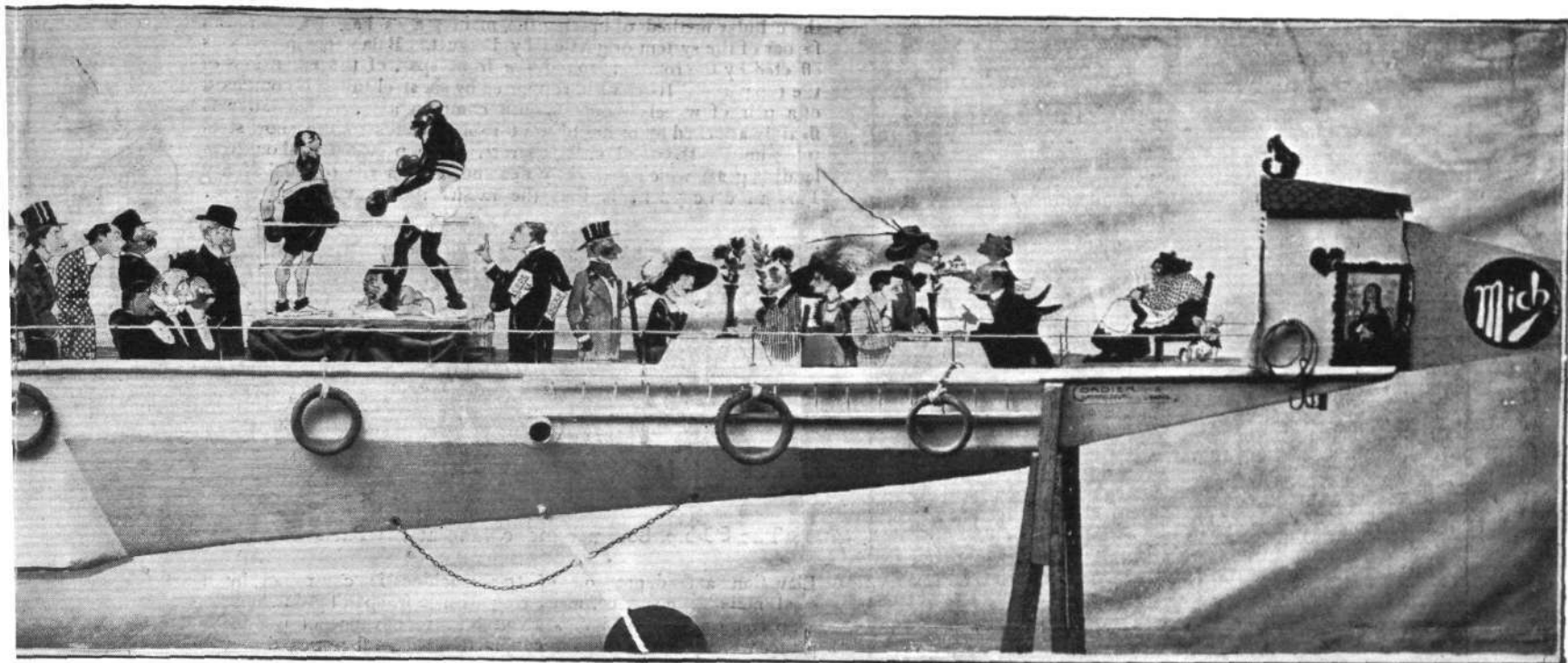
Principal dimensions, &c. :—

School type—

Length ...	25 ft.	Weight ..	500 lbs.
Span ...	29 "	Speed ...	55 m.p.h.
Area ...	165 sq. ft.	Motor ...	35-h.p. Anzani.
Price ...	£460.		



Details of the landing chassis of the Henry Farman monoplane.



by a fantastic airship with a cargo of French celebrities of the stage and the aviation world. From left to right: The pilot at the wheel, Latham, Beaumont, Weymann, Legagneux, Brézi, Henry Farman, Paulhan, Maurice Farman, Granet, Esnault Pelterie, Latham, Blériot, Duval, Réjanz, Brassier, Sorel, Maurice Rostand, Polaire, Edmond Rostand, Galipaux, Jeanne Block, her dog, and La Joconde.

monoplane. Description of these excellent machines would be unnecessary in the case of the former model for, apart from the staggering of the main planes and the reduced dimensions throughout, it presents no point of difference from the one exhibited at the last Aero Show at Olympia. In the case of the latter a recapitulation of its main features would be but repetition of the article that appeared in these pages only a fortnight since.

Principal dimensions, &c. :—

Maurice Farman biplane—

Length ...	30 ft.	Weight ...	946 lbs.
Span ...	36 "	Speed ...	55 m.p.h.
Area ...	385 sq. ft.	Motor ...	70-h.p. Renault.
Price ...	£1,000.		

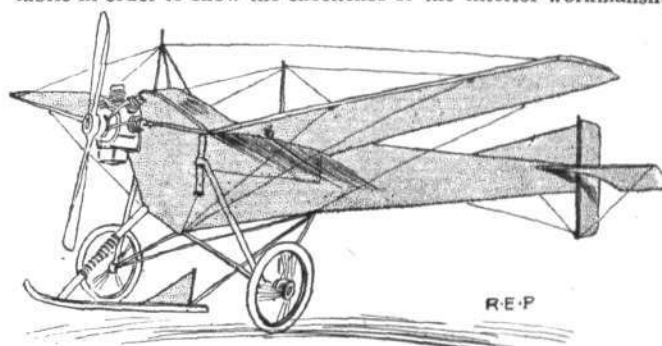
Henry Farman monoplane—

Length ...	25 ft.	Weight ...	630 lbs.
Span ...	33 "	Speed ...	65 m.p.h.
Area ...	165 sq. ft.	Motor ...	50-h.p. Gnome.
Price ...	£1,000.		

Robert Esnault-Pelterie.

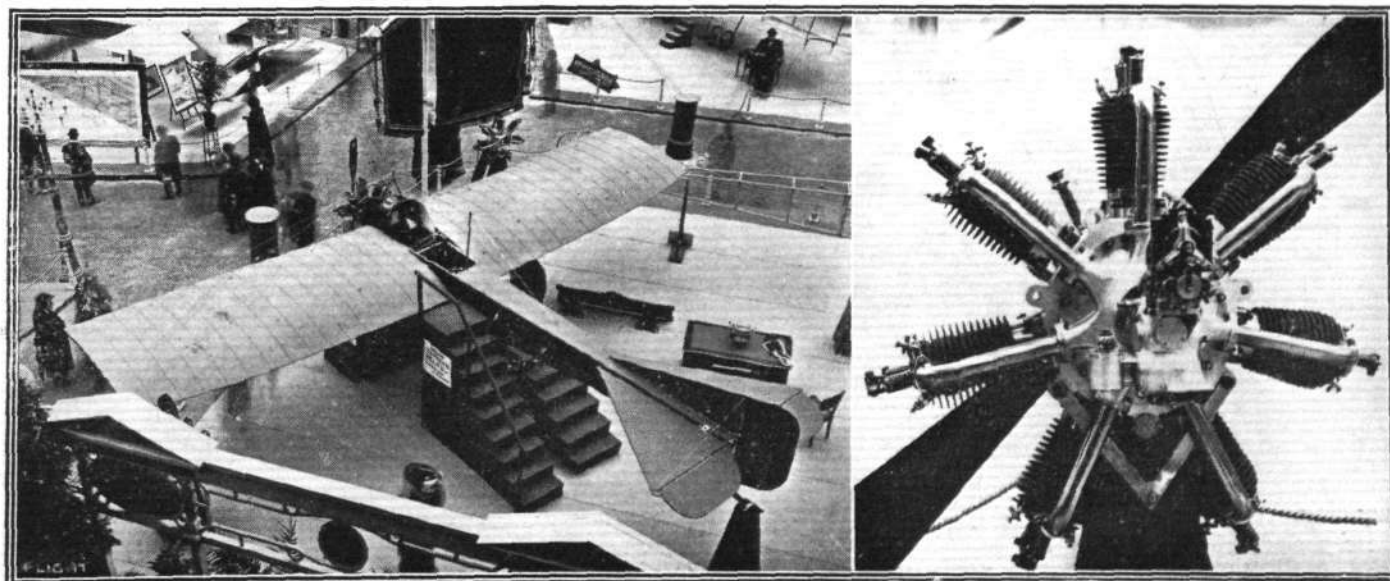
ON the R.E.P. stand two machines were exhibited, one completely erected and resplendent in its characteristic covering of red

fabric, and the other a simple fuselage, denuded of its covering of fabric in order to show the excellence of the interior workmanship.

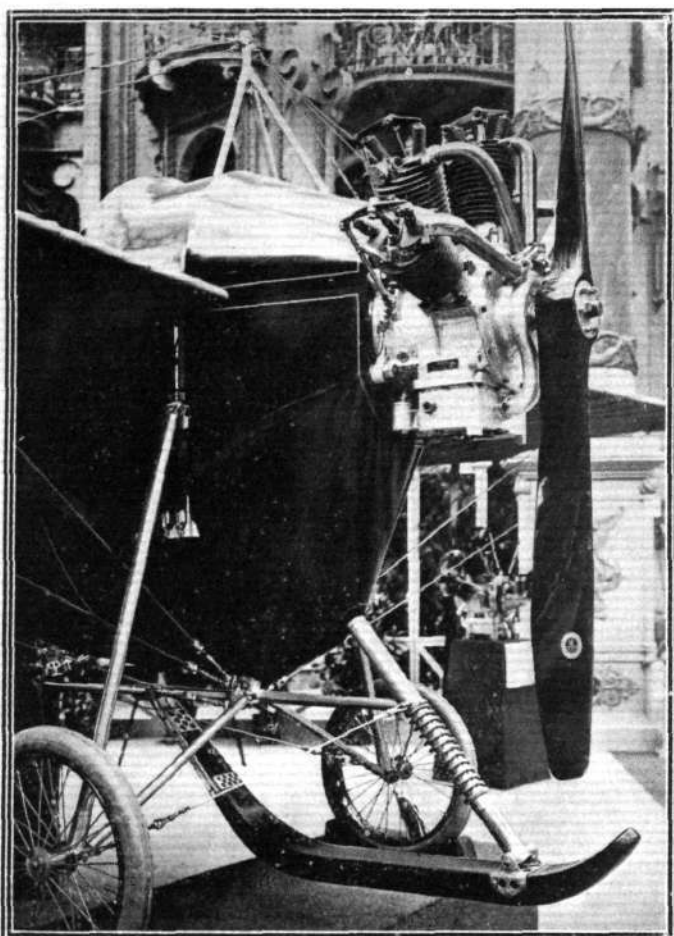


The R.E.P. monoplane.

A description of these machines is unnecessary, as they do not differ in any detail from the R.E.P. monoplane which competed in the



The R.E.P. stand at the Paris Aero Show, and the new 90-h.p. 7-cyl. R.E.P. motor.



Detail view, showing the front section of the beautifully-constructed R.E.P. monoplane.

Circuit of Europe, and with which our readers are already acquainted. The new 90-h.p. R.E.P. motor, which has its seven cylinders arranged radially around the crank case, was also on exhibition on the stand.

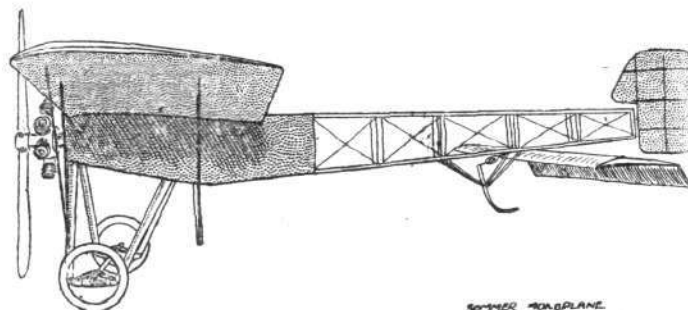
Principal dimensions, &c. :—

Length ...	25 ft.	Weight ...	880 lbs.
Span ...	40 ft.	Speed ...	68 m.p.h.
Area ...	220 sq. ft.	Motor ...	60-h.p. R.E.P.
Price ...	£1,200.		

Roger Sommer.

ROGER SOMMER was represented at the Salon by two machines, a monoplane and a biplane, the latter constructed throughout of

steel. The biplane should really be termed a double monoplane, for the cellular method of bracing the main planes has disappeared in favour of the system originated by Breguet. Balancing laterally is effected by the rotation around the front spar, of the extensions of the top plane. Its chassis, supported by six steel tubes, is composed of a pair of wheels mounted on a common axle, which latter is flexibly attached by means of stout rubber bands to the short steel tubes uniting the steel chassis struts. One peculiarity about this landing gear, which is directly descended from the original Henry Farman conception, is that the radius rods have disappeared.



The 50-h.p. Sommer monoplane at the Paris Salon.

Elevation and depression of the machine is controlled by a small monoplane surface, measuring about 2 ft. span by 1 ft. chord, supported on steel outriggers about 8 ft. in advance of the main plane, which surface works in conjunction with a flap hinged to the rear of the lifting tail. Its diminutive size makes one wonder if this surface is of any use at all as an elevator, and the only apparent advantage of the system is that the outriggers form a good point from which to brace the main planes against drift strains.

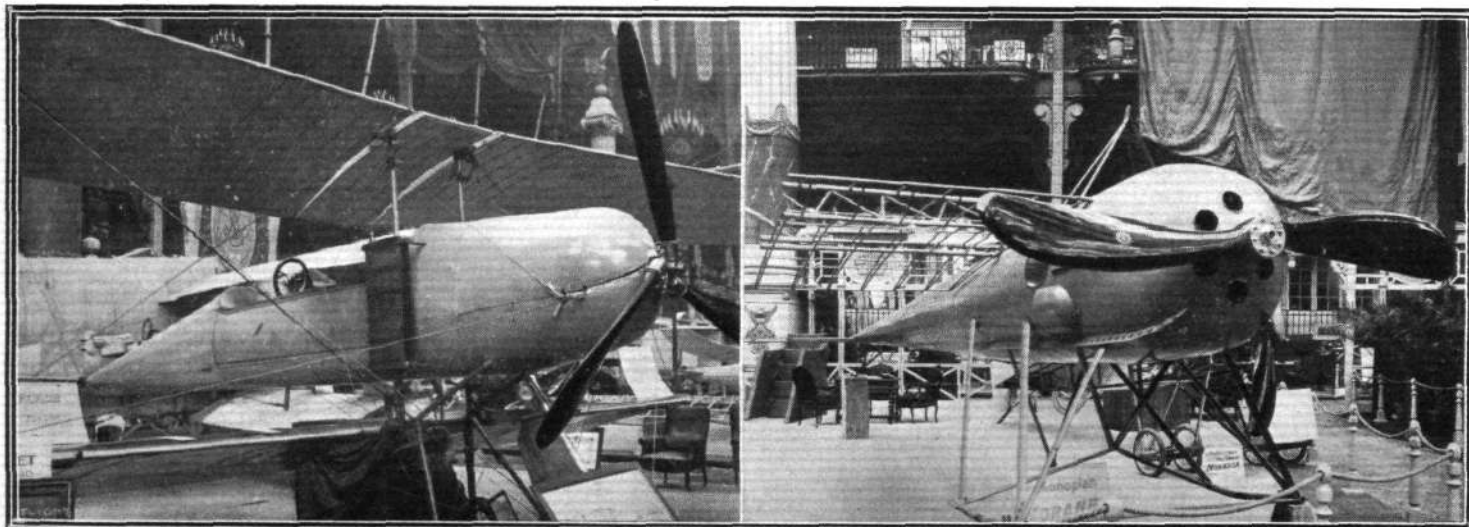
The main planes, which are double-surfaced with leaf-green fabric, for the purpose of rendering them invisible when close to the ground, are tested before they leave the works to withstand a strain of four times that they are ever likely to be called upon to bear in normal flight.

Principal dimensions, &c. :—

Biplane—			
Length ...	30 ft.	Weight ...	640 lbs.
Span ...	40 ft.	Speed ...	56 m.p.h.
Area ...	330 sq. ft.	Motor ...	50-h.p. Gnome.
Price ...	£840		
Monoplane—			
Length ...	22 ft.	Weight ...	575 lbs.
Span ...	29 ft.	Speed ...	65 m.p.h.
Area ...	176 sq. ft.	Motor ...	50-h.p. Gnome.
Price ...	£640.		

Vinet.

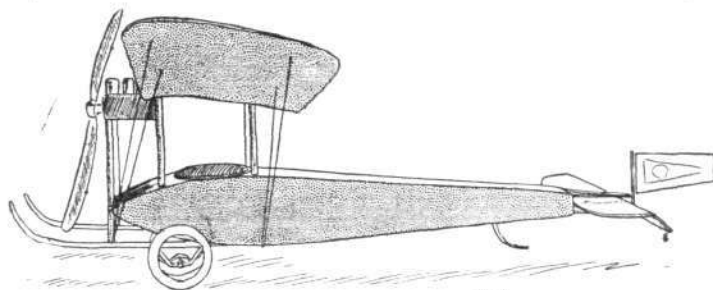
Two types of monoplane were represented. The first was of a modified Blériot type with flat stabilizing tail and wheel and skid undercarriage, the second was of the low centre of gravity type. As the first of these models presents no striking departure from



AT THE PARIS AERO SALON.—The current trend of design towards the torpedo type of body is well illustrated by these photographs: the Aero Torpedo on the left is the two-seater Breguet, with Chenu motor, and on the right is the unfinished Morane-Saulnier war monoplane; it is constructed entirely of steel, including the wing skeletons.

accepted practice, we will confine our description to the latter of the two, of which a sketch is produced herewith.

The body of the machine is constructed on the box-girder principle and to preserve its excellent streamline form is completely covered in with fabric. Arranged above the pilot on a superstructure of wood crossbraced with steel wire are the motor and the wings. The



The Vinet monoplane.

landing gear is characteristic for its extreme simplicity, consisting merely of a pair of skids proceeding forward from the fuselage and a pair of wheels, mounted on a common axle attached thereto by means of channel steel outriggers and rubber straps. The flat stabilising tail is roughly semi-circular in shape and flies circumference foremost, the elevator, a rectangular flap, being hinged to its rear edge.

Principal dimensions, &c. :—

A-type monoplane—

Length ...	26 ft.	Weight ...	450 lbs.
Span ...	30 ft.	Speed ...	55 m.p.h.
Area ...	176 sq. ft.	Motor ...	50-h.p. Anzani.
Price ...	£720.		



Badge for Aero Club of France.

THE Aero Club of France has now adopted a badge, which can be attached by members to the radiator-filler caps of their cars.

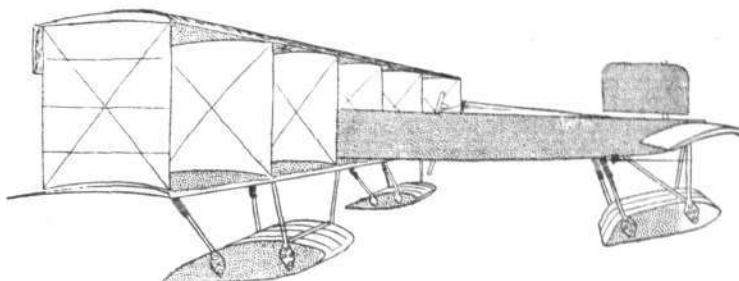
The badge, designed by M. A. Schelcher, consists of the outline an ordinary balloon, on the centre of which is a pair of bird's wings, and diagonally across them a two-bladed propeller is placed.

Low C.G. type—

Length ...	22 ft.	Weight	375 lbs.
Span ...	30 ft.	Speed	58 m.p.h.
Area ...	176 sq. ft.	Motor	35-h.p. Barriquand and Marre.
Price ...	£440.		

Voisin.

THE *Canard* on view on this stand is essentially the same in every detail as those which represented the Voisin firm in the Military



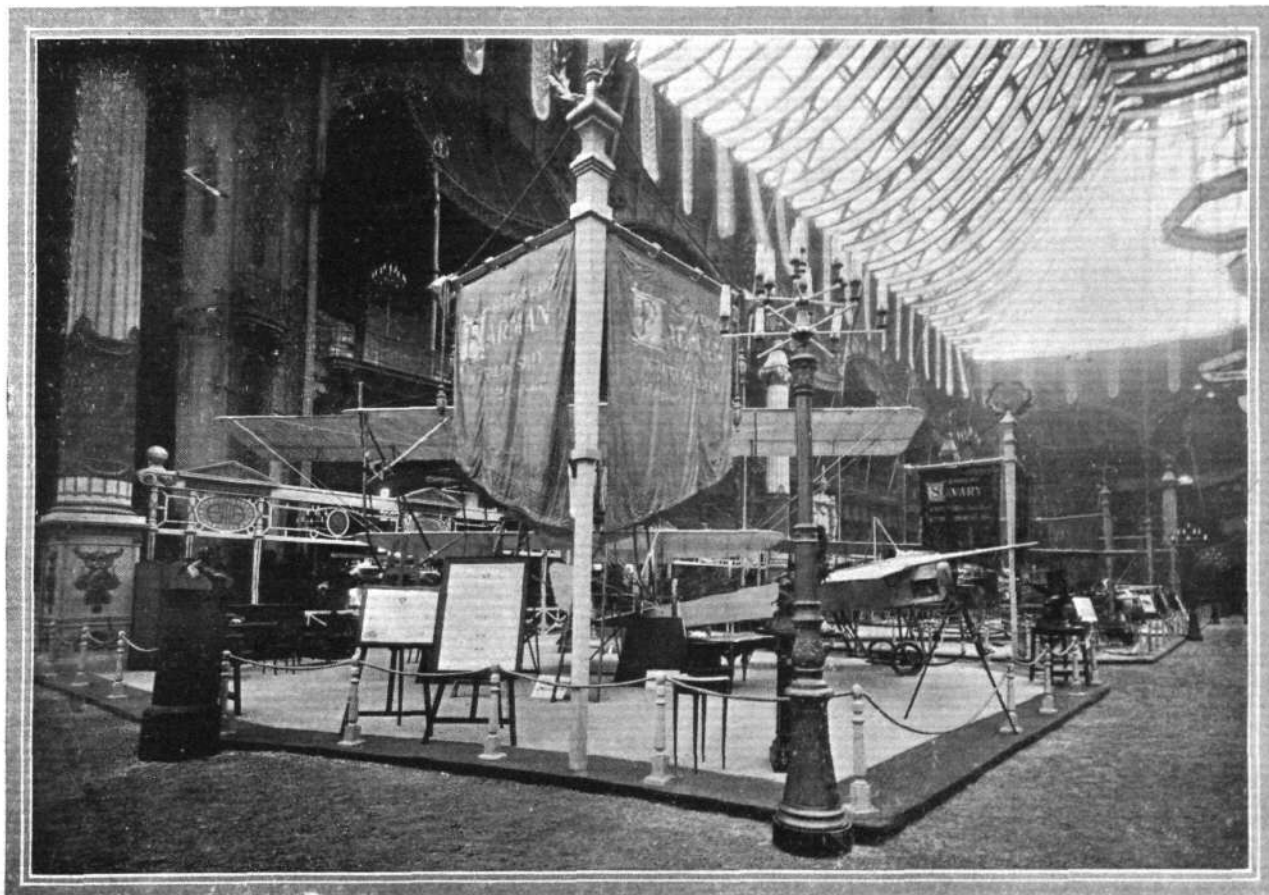
The Voisin "Canard" equipped with floats.

Trials at Rheims, with the exception that, being designed to rise from and alight on water the usual landing gear is replaced by a system of floats.

Principal dimensions, &c. :—

Length ...	26 ft.	Weight ...	1,210 lbs.
Span ...	40 "	Speed ...	56 m.p.h.
Area ...	473 sq. ft.	Motor ...	70-h.p. Gnome.
Price ...	£1,200.		

(To be continued next week.)



The Farman stand at the Paris Aero Salon, showing, in addition to the latest type Maurice Farman biplane, the Henry Farman monoplane, described last week in FLIGHT.

THE BRITISH WAR OFFICE TRIALS.

FOLLOWING upon the announcement of the specifications of the War Office Trials, which was published in our issue of December 23rd (p. 1109), we have received the following interesting and important communications on the subject from some of the manufacturers who are, presumably, likely to be among the prominent participants in this event. In such a medley of opinion as has been expressed by all and sundry in regard to the clauses of the specification, it is at least worth hearing what those most concerned have to say on the subject:—

Mr. L. Howard-Flanders:—

On the whole, the conditions of the military trial seem very fair and well drawn up. The result should be an extremely useful sound type of aeroplane, not only for military purposes, but also for ordinary cross-country flying. The specification is certainly difficult, but several British machines have already put up a performance, nearly, if not quite as good as that required.

The prizes are extremely small, and it seems difficult to understand why the richest country in the world should be unable to afford an adequate sum.

The purchase of the aeroplane for £1,000 is also hard to understand, as surely if a suitable engine costs £900, or something about that figure, it is absurd to expect to buy a sound aeroplane, less engine, for £100, or even three times that figure.

Dealing with the actual specification clause by clause:—

1. Unnecessary, an aeroplane should be flown not sent about by rail.
2. Good.
3. To climb at 200 ft. per min. is difficult, but certainly desirable for use in England.
4. Some encouragement should be given for speed.
5. Very difficult to estimate with accuracy and fairness, but a very desirable feature.
6. The actual length of the grass or clover should be stated.
- 7 (and 6). This is more difficult for a machine with a fine gliding angle than one with an angle of about 1 in 4.
8. Simple, but open to the same objection as No. 1.
9. Good.
10. This should be more explicit.
11. Good; none of the French machines are as yet so strictly interchangeable as the present-day motor car.
- 12 (a, f, g). This should be done by the makers of the engine. Other points good.
13. All forms of anchors or clips to hold the machine back (mechanically) should be barred.
14. a. Good.
b. Should be compulsory.
c. Difficult to judge.
d. 20 per cent. is the maximum likely to be attained.
e. Good.
f. Bad. Things that are easily detachable may become detached unintentionally, a bad thing for planes.
g. Should be 150 ft.

A. V. Roe and Co.:—

The tests in connection with the proposed Military Aeroplane Competition are somewhat stiff, but we do not think we shall have any trouble in passing them, and on the whole they meet with our approval, except that several of the tests concern the pilot, not the machine. In fact, it would have been very much better to have divided the tests into two portions:—

1. The conditions being for the purpose of testing the aeroplane.
2. The conditions with the object of testing the engine.

In both cases, of course, the tests being as much as possible those effecting the machine or the engine, and not the pilot.

It is also a matter of regret that it was not made necessary for the competing machines to have been built in this country, for to our idea the competition was more to encourage the designers and builders of aeroplanes, and the mechanics who actually do the work, rather than finding out the best machine, which is quite unnecessary, in view of the fact that the French have just had a military competition which would have given us all the information required on this point, and the competition between the various builders would have been quite sufficient to have brought out their best.

We have only seen the conditions in the Press, and none of them mention any provision which would encourage the designing and building of aeroplane engines. Many aeroplane builders will doubtless say that with few exceptions the British engine maker has not done his share, but the important point is that we must not let the country at large suffer for this. If encouragement is given to the aero engine makers they will wake up, and at the same time more outside capital will be introduced, which will encourage this very important branch.

Mr. Horace L. Short (Short Brothers):—

Re the War Office specifications for aeroplanes; the conditions contained therein are more or less what are generally required for Army use at the present time, but from our own experience in matters appertaining to aviation we are fully certain that had the specifications been a little wider, machines of a very much safer and far more reliable type could have been entered.

Mr. D. Lawrence Santoni (British Deperdussin Aeroplane Synd., Ltd.):—

As a whole the conditions do not seem to be over difficult; one or two items will require some modification in the existing types of machines, but no doubt most of the conditions will be fulfilled. I give a detailed reply to the various items below:—

1. Be delivered in a packing case, &c. Quite feasible.
2. Carry a live load of 350 lbs., &c. This is not difficult.
3. Fly for three hours loaded, as in Clause 2, &c. Ditto.
4. Attain a speed of not less than 55 m.p.h., &c. Ditto.
5. Plane down to ground in a calm, &c. This will be found to be far more difficult than most people imagine. In fact, I think very few machines will do it. It will also be difficult to measure accurately.
6. Rise without damage in long grass, &c. Quite feasible.
7. Land without damage on any cultivated ground, &c. This depends on the pilot's skill, but it is not very difficult. Brakes of some sort will have to be fitted to pull-up in 75 yds. on a smooth ground.
8. Be capable of change from flying trim to road transport, &c. Easy.
9. Provide accommodation for a pilot and observer, &c., &c. Easy.
10. The pilot's and observer's view of the country below them to front, and flanks must be as open as possible. This may need some alteration in existing machines but good results can be expected.
11. The engine must be capable of being started by the pilot alone. This will need some arranging but I imagine will be done. It will add to the weight of machinery.
12. Amongst the desirable attributes. The one most difficult to carry out will be the silencing of the engine; with the Gnome, of course, this is impossible; in water-cooled engines it will probably be attempted but will undoubtedly absorb a certain amount of power, which will necessitate a larger h.p. engine. This again will entail a larger machine. How that machine is to be built for £1,000 I cannot conceive under existing circumstances.



A New Clement Dirigible.

IT is announced that the French Government have ordered a new dirigible of 10,000 metres capacity from M. A. Clement, and that construction is well under way at Levallois Perret.

Trial Trip with "Parseval XI."

ON December 23rd, the "Parseval XI," having five passengers on board, left Bitterfeld with the object of going to Johannistahl. After an hour and three-quarters travelling it passed over Juterbog and landed at Treebin, 30 kiloms. to the south-west of Berlin, after being in the air for three hours, it was then decided to remain there for the night.

AIR EDDIES.

WAR OFFICE orders are beginning to dribble out. In this connection, the British and Colonial Aeroplane Co., Ltd., have booked orders from the authorities for their Bristol Military two-seater monoplane. Through their enterprise in exhibiting at the Paris Aero Salon they have already received commands to supply Foreign Governments, so their works should be running at top speed for some time to come.

America looks like producing an aviation "Pennington" judging by the startling claims made by Wallace E. Tillinghast. Among other things he claims to have discovered the principle of soaring flight, and says that two years ago he remained stationary for an hour several thousand feet above Long Island. Incidentally he asserts that the Wrights' soaring experiments have been discontinued because of his patent rights. It seems extraordinary that nothing has been heard of this scheme before, and no surprise will be felt that absolute secrecy and refusals to give any outward demonstrations are the guiding features of this inventor.

A special train of eight cars left Washington on November 28th, or Augusta, Georgia, carrying the Army Aviation Corps to their winter camp. Capt. Chandler is in charge, assisted by Lieuts. Kirkland, Arnold, and Milling, with Dr. J. P. Kelly as physician.

The rumour was current a few days ago in Paris that the two well-known Belgian aviators, Van den Born and Jules Tyck, both of whom had already made flights in the Far East, had volunteered their services to the Turkish Government for action at the seat of war in Tripoli. The report is absolutely unfounded, however, and the kindly feelings that they entertain towards their friends in Italy have prompted both these aviators to utter strong denials. As a matter of fact Van den Born has been suffering these past three months from a violent attack of rheumatism, and as it was at the expense of all his available energy that he managed to drag himself from his quarters in Paris to the offices of a Paris contemporary to make protest in person it is evident that he is scarcely in a fit condition to undertake military service.

As for Jules Tyck, I am glad that this affair has brought his name into the papers, for he was "killed" by the Press some time since, and even from the Aero Club of Belgium was it impossible to get confirmation of this or any knowledge as to his whereabouts.

A very noticeable feature about the trend of design at the Paris Salon is that most of the French constructors of biplanes are adopting the fuselage as a central unit in the construction of the machine and, for safety's sake, are placing the engine in front of the pilot. This is really somewhat of a compliment to constructors on this side



"Le Triumphe de la Navigation Aérienne."

THIS is a veritable *Magnum opus* in which Count Henry de la Vaulx has set down his observations of the practical development of aerial navigation during the past decade, to which he considers it is more or less confined. To readers of FLIGHT, and to those who followed the history of aerial navigation in the pages of *Auto*, previous to 1909, Count De la Vaulx needs no introduction, and although he is better known for his work in connection with balloons and dirigibles, he has not failed to take a lively interest in the development of the heavier-than-air machine. The opening chapters are devoted to ballooning, and then the author passes on to the dirigible balloon, and from that to the aeroplane. He has endeavoured to place himself in the position of an independent observer, and from that point of view notes the various facts of the development of aerial navigation during the past ten years, and points out their consequences. Technicalities are tabooed, except in so far as they are necessary to permit of a clear understanding of the characteristics of the various things described. Apart from the interesting reading which the book provides, there is a most valuable collection of photographs; in point of fact, there are about 300 in the 400 large quarto pages which go to make up this mighty tome, and the volume will be valued for these alone. The book is published by Jules Tallandier, Paris, at the price of 12 francs stitched in paper covers, and 16 francs bound. Incidentally, it is extraordinary, bearing in mind the admirable way in which the book is printed and illustrated, that, as in most cases with French books, the binding and cover, of the cheaper edition at any rate, are totally inadequate for the large volume, and are not even worthy of the ordinary sixpenny novel as produced in England. If properly bound, the 16-franc edition should assuredly be the most satisfactory in the end.

of the Channel, and to Mr. A. V. Roe in particular, for to that gentleman must be given the credit of originating this type of design.

Not content with the already successful type of hydro-aeroplane which has been used with so much success in the States, Glenn H. Curtiss has returned to San Diego, California, where he intends to spend the winter in carrying out further experiments on this type of craft. He has already produced one new machine, in which the engine is mounted above the midway position in the gap between the main planes, and the pilot is seated much lower down than heretofore. It will be remembered that a report has been circulated around New York, as mentioned in last week's FLIGHT, that Louis Paulhan, who is at present engaged in an action with the Wright Brothers, has ordered one of these machines to be delivered to him next month.

In contrast to the success that E. F. Driver and C. Compton Paterson have already attained in Cape Town, comes the very unwelcome news that the latter well-known pilot met with what might have been a serious accident while giving an exhibition on his biplane at the cycle track at Green Point on Tuesday afternoon last. According to reports the elevator jammed while he was at a height of about 40 ft. and, losing control of his elevation, he was forced to land somewhat abruptly, with disastrous results to his machine. Paterson was taken away to the hospital where his injuries were found to be nothing more serious than several nasty bruises.

As an indication of the public belief in the aeroplane as a sporting and commercial vehicle of the future, it is interesting to notice that at a meeting of the London County Council some time since, a question was asked of the Chairman of the Establishment Committee whether, in view of the fact that the new County Hall would not be completed until four years hence, his Committee would consider the advisability of equipping the roof of that building as a landing ground and garage for the use of aviating members. His reply was to the effect that at present he considered the river a much safer landing spot but should the science of aviation have advanced by that time to make such a provision desirable, the proposition would doubtless receive every consideration.

In order that they may more fully centre their attention on the production of the celebrated Indian motor cycles, the Hendee Manufacturing Co. have decided to abandon the manufacture of the rotary aero motor which has been under a practical test at the hands of Grahame-White in the States.

"OISEAU BLEU."



A Compendium of Aviation and Aerostations.

IN the opening chapter of this little book, Col. Hoernes says that its purpose is to place before the reader a simple elementary picture, briefly sketched, of the main principles of aerostation and aviation. The book is one intended for the general reader, who will find that he is not bothered by any obtuse theories or fierce mathematics, although the "How, Why, and Wherefore" is explained sufficiently for the novice to get an intelligent idea of how the different parts work. The book is illustrated by a very large number of photographs, although they are, in nearly every case, of old machines, and it is rather surprising to find newer and more successful machines not represented. The book, which is of a handy pocket size, is published by Messrs. Chas. Griffin and Co., at 2s. 6d. nett.

All About Airships.

THE title of this book is somewhat of a misnomer, as the author, Mr. Ralph Simmonds, does not restrict himself to dirigible balloons, but deals also with kites and gliders, and more than half the book is taken up with aeroplanes. Being written for boys, the story of the early attempts at navigating the air, and the subsequent development after success had been attained is told in what one might term an adventurous spirit, and any boy who finds it among his presents is pretty sure to appreciate it. As, after reading this, many boys would wish to try a little flying for themselves, it was a happy thought on the part of the author to include a short chapter on "How to build a simple monoplane," together with the necessary diagrams. The book is well illustrated by a large number of photographs, all excellently reproduced, which add considerably to its value. It is published by Messrs. Cassell and Co., at the price of 6s.

FROM THE BRITISH FLYING GROUNDS.

Royal Aero Club Flying Ground, Eastchurch.

WITH most of the aviators away for the Christmas holidays, the Eastchurch Aerodrome presented a very quiet appearance during the week. —

Travers was out for a few hours' practice with Barton and Cutler, of the Territorial Balloon Section, and this was the only flying done until Saturday.

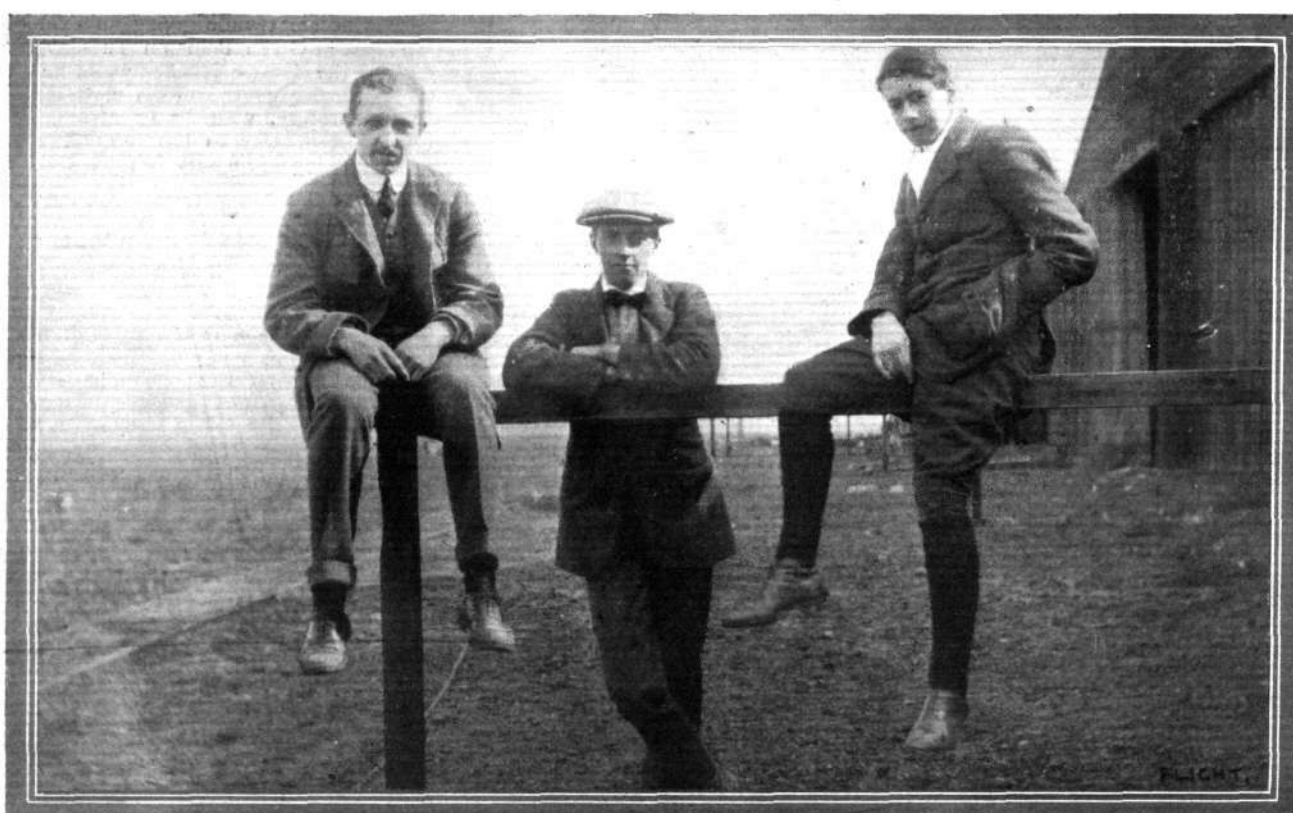
On this day, in the afternoon, Lieut. Dunne made a very successful flight on the Dunne monoplane, which he has just fitted with a 50-h.p. Gnome. The improvement in the flying of this machine, in consequence of the extra horse-power, was at once noticeable. Lieut. Dunne made several laps of the aerodrome and passed over the village of Eastchurch before returning to earth. He was highly satisfied with the behaviour of his machine, which he stated was extremely steady in the air and answered the steering control very readily. Jezzi was also down for the day with a view to putting in a few flights before Christmas, in which purpose he was very successful. His machine is now in the pink of flying condition, and

his flying on Saturday showed to advantage its high speed and exceptional steadiness in the air. It would be most interesting to see a speed test over a measured course with this machine, which is undoubtedly fast.

London Aerodrome, Collindale Avenue, Hendon.

Ewen School.—At the W. H. Ewen School, the mechanics have been busy erecting the machines after their transference from Lanark Aerodrome. On Friday, Mons. Edouard Baumann, a new Swiss pupil, had his first instruction in the hangar. Mr. W. T. Warren, who was flying so well at Lanark, expects to qualify for his *brevet* at an early date.

On Saturday, Mr. Ewen had the Deperdussin out in the morning for a preliminary trial, and in the afternoon he was again flying several circuits. Great interest is being shown in the 28-32-h.p. Deperdussin, for it will be remembered that this is the machine on which Mr. Ewen made his flights across the Firth of Forth, and from Lanark to Edinburgh.



THREE OF OUR HENDON AVIATORS.—Clement Greswell, late of the Grahame-White Aviation Co., Ltd., is in the centre, and to the right and left respectively are A. S. Henderson, of the Blériot School, and C. F. M. Chambers, the latter having lately been flying the Valkyrie monoplane with great success, and who secured his *brevet* last week.



Flying Resumed at Filey.

As soon as the weather is suitable, flying will be resumed at Filey, where Mr. Brereton has arrived to take the place of the late Mr. Hubert Oxley as instructor at the Blackburn school. Mr. A. Castle Hunt is also continuing his course of instruction, and should qualify for his *brevet* very soon now. A new Blackburn monoplane, fitted with an improved Isaacson engine, has arrived at the flying ground, and another new-comer is an Anzani-engined Blériot.

A Monoplane for the Transvaal.

HAVING learnt to fly a monoplane at Brooklands, Mr. Antony Baldwin, who claims to be the first Herefordian to take up aviation, is now on his way back to the Transvaal, where he holds an appointment as a mining engineer, with a monoplane on which he hopes to do some good flying on the Rand.

New Trans-American Prizes.

FRIENDS of Mr. C. P. Rodgers have offered a gold cup and prizes up to \$8,000 for any aviator who can beat the trans-American record of 49 days. For every day under forty taken off the record \$500 will be given, and for each day under thirty-five \$1,000 will be awarded.

A New Hydroplane Record.

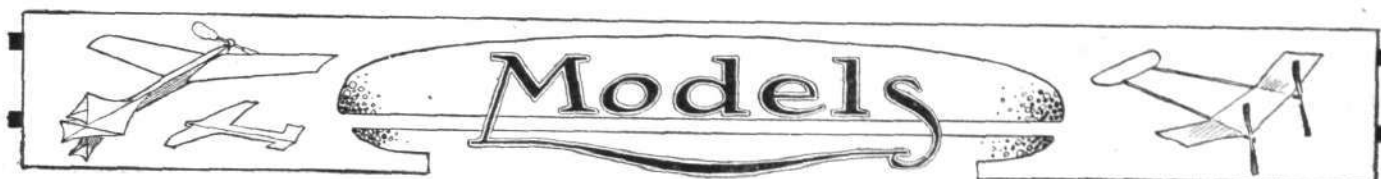
A VERY fine flight, which, it is claimed, is a record point-to-point performance on a hydro-aeroplane, was made by Harry N. Atwood, on the 21st inst. Starting from Point of Pines, he flew along the coast to Providence, where he came down in Narragansett Bay, having exhausted his supply of petrol, the distance covered being about 130 miles.

Wright Biplane for American Museum.

THE American Government are determined that posterity shall not be without something of the early days of aviation, and so the biplane which Orville-Wright flew before the Army authorities in 1908 and 1909, has been sent to the National Museum at Washington, where it will rub shoulders with original Morse telegraph and Graham-Bell telephone instruments. The machine, which was bought by the United States Government for \$3,000, was used during the San Antonio manoeuvres at the beginning of this year.

New U.S. Aerial Artillery.

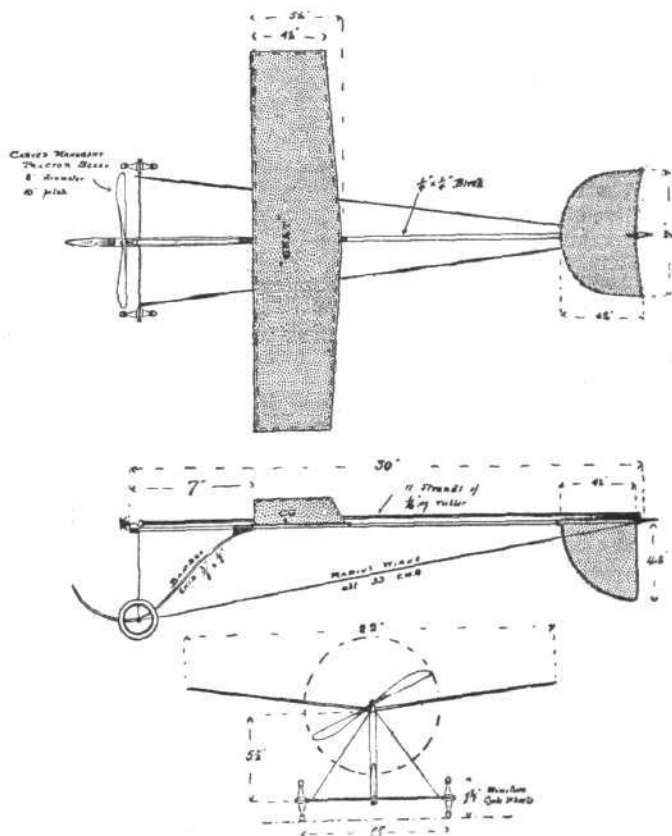
TRIALS are shortly to be carried out at Sandy Hook with a new six-pounder gun built at the Rock Island, Ill. Arsenal for defensive use against aeroplanes. Special sighting instruments are attached to the weapon which can be fired vertically.



Conducted by V. E. JOHNSON, M.A.

Tractor-Screw Self-Rising Models.

WE give this week particulars and scale drawings of a very interesting model of the above type, designed and constructed by Mr. J. Dollittle, of the Blackheath Aero Club. The drawings and following particulars have been supplied us by Mr. A. B. Clark, the secretary of the club. The main plane, which has no camber, is constructed of $\frac{5}{16}$ by $\frac{3}{8}$ in. silver spruce, and is placed quite flat on the central rod, *i.e.*, without any angle of inclination with respect to it. The wings have a dihedral angle of 1 in 12, and are covered with proofed silk. The tail plane is set at a negative angle of 1 in 24, *i.e.*, about $2\frac{1}{2}^\circ$. The complete weight is $4\frac{1}{2}$ oz.; speed from 18 to 20 m.p.h. The model will not fly unless fitted with the vertical fin as shown in the drawings, this applying to either a single or twin-tractor model. The model flies some 450 feet, the wheels used are somewhat heavy, but combined with the massive central skid they serve a very useful purpose, *i.e.*, they bring the weight well forward. The tractor-screw, which (if bought) should preferably be of the "central" type, should not have a greater diameter than 8 ins. Commenting on the above, we are not at all



surprised to learn that when a single tractor-screw is used it should not have a greater diameter than 8 ins., or that the vertical fin must on no account be omitted, owing (presumably) to the unbalanced torque of the motor. But that the same should apply, with respect to the vertical fin, when using twin propellers of opposite pitch is curious, and could scarcely, we should think, be applied to this type of machine in general. The position of c.g. (the centre of gravity) should be carefully noted, it must be well forward in this type of model. Supposing we used two wheels constructed of brass (such as curtain rings which can be bought at 4 a penny), with two narrow pieces of thin tin at right angles, lightly soldered (which are only half the weight of the commercial rubber-tired aluminium wheels) and also lessened the dimensions and weight of the skid; then we should probably be able to use two propellers instead of one (especially if they were lightened by careful sand papering) with the result that the length of flight would be considerably increased. Some re-adjustment of the main plane would in all probability be necessary in order to retain its old position with respect to the

centre of gravity. If we compare the length of flight made by this model with one possessing twin propellers in the rear and a front rider plane, *i.e.*, an elevator, we find an apparent decided advantage in the latter type. For instance, on August 10th last, a self-rising model biplane, designed and constructed by Mr. G. P. Bragg Smith, flew a distance of 945 feet, and the writer has a self-rising monoplane of the type referred to which has flown just over 300 yards and remained in the air for 57 seconds; the dimensions of the latter machine are 52 ins. in length by 29 ins. span, total weight $6\frac{1}{2}$ oz. We mention these facts not for the sake of making comparisons in favour of the latter type, but because we hold the opinion that the tractor-screw type should be capable of beating the other, at any rate, so far as the monoplane model is concerned. Speaking personally, we should very much like to see a self-rising tractor-screw model (monoplane or biplane) cover a quarter of a mile or remain at least 60 seconds in the air. The amount of run taken by the model illustrated in this article is not mentioned; the $6\frac{1}{2}$ oz. model referred to rises in its own length off a strip of linoleum.

Referring to the speed, 18 to 20 m.p.h., we should be glad to know whether this is an estimated speed, or one arrived at from a measured distance flown in a given time. If we apply the empirical formula, $w = \frac{v^2 c}{g}$, where w = weight lifted in lb. per sq. ft., v = vel. in ft. per sec., c = a constant = 0.25, g = 32.2, or 32 approx., we find a velocity of sustentation of about $16\frac{1}{2}$ m.p.h., a result in very close agreement with a flight velocity of 17 to 18 m.p.h. Now our constant, $c = 0.025$, was arrived at from results obtained chiefly with Clarke's flyers, and we are anxious to know how far it can be satisfactorily applied to other types. We might just mention that the $6\frac{1}{2}$ oz. model referred to was similar to Mr. Dollittle's model in that the main plane had no camber, and were placed flat on the central rod.

Notes.

We have received a letter from a correspondent under the *nom de plume* of Victor M. (we are unable to judge from his letter whether he wishes his real name to be divulged or not) in which he states that at the Lee Aerodrome, on December 17th, his $2\frac{1}{2}$ oz. Victor monoplane flew a distance of 2,265 ft. He wishes to know if this is a record for this size model. Length of model 31 ins. span, 15 ins. propellers, $7\frac{1}{2}$ ins. diameter. The pitch is not given. Total weight just under $2\frac{1}{2}$ oz. The weight of rubber is not stated. Finally, he asks our opinion as to whether we think it possible to achieve greater distances than 755 yards with a model of this weight.

Now this letter raises several very interesting points; for instance: 1. The greatest (theoretical) possible distance that a given model can fly; (2). The relation existing between the size, or rather, perhaps, weight of the model, and the length or duration of flight; (3). Records and wind records—*anemometry*, *i.e.*, the influence of the wind on the length or duration of the flight.

Referring to 1, this question has been quite recently discussed in the correspondence columns, but no really satisfactory conclusion was arrived at owing to the uncertainty existing with respect to the possible energy derivable from 1 lb. of rubber. No correspondent has yet replied to our query *re* this (December 9th issue); but we note that "Aerophile," in a contemporary, states that 1 lb. of rubber is capable of giving out 300 ft.-lbs. of energy, which agrees with what we have ourselves stated.

Referring to 2, we will deal with this in next week's issue.

With reference to number 3, we believe we are correct in stating that there are so far no official records using the word in its strictest sense. We do not know the exact date at which the kite and model Aeroplane Association was appointed by the Royal Aero Club to be the authority to govern model records, but it was first announced in FLIGHT in the issue of October 28th. Now, in all official records about to be made under the auspices of this body, the wind velocity will be measured and deduction made for the speed of the wind.

It is obvious as a matter of common sense that before any proper comparison can be made between different records, it is absolutely essential that we should know the wind velocity, and that a proper allowance be made for it. Hitherto this has not been done, and in consequence no reliable comparisons are so far possible.

We are thus brought face to face with the question of correct wind measurement or *anemometry*, of which, as it so happens, we once made a special study, and we will deal with it in an early issue.

PROGRESS OF FLIGHT ABOUT THE COUNTRY.

NOTE.—Addresses, temporary or permanent, follow in each case the names of the clubs, where communications of our readers can be addressed direct to the Secretary. We would ask Club Secretaries in future to see that the notes regarding their Clubs reach the Editor of FLIGHT, 44, St. Martin's Lane, London, W.C., by first post Tuesday at latest.

MODEL CLUBS.

Aberdeen Aero Club (387, HOLBURN STREET, ABERDEEN).

DESPITE the cold and wintry weather on December 23rd some fine flying was seen. Mr. Geddes was out experimenting with a model which showed good flying capabilities. Mr. Scott also obtained some good flights with a single screw machine. The best flights of the afternoon were made by Mr. Gray, who did 550 ft. repeatedly with 250 turns.

A meeting will be held at the clubroom, 407, Holburn Street, on Wednesday, 3rd January, 1912, at 7.30, when it is hoped there will be a large attendance of members as some important business is to be discussed. Members who have not yet forwarded their subscriptions are asked to send same to the Secretary.

Birmingham Aero Club (8, FREDERICK ROAD, EDGBASTON).

LAST Saturday week brought out Mr. E. Trykle with a new twin-propeller model, which showed promise of doing big things in the near future. Several other members were also getting good results with new models. The great attraction of the afternoon was, however, the trials of the model glider. After being towed to a height of 150 to 200 ft. the cords were loosed, and the glider now being free, made a splendid glide from that height. This was repeated several times. It was afterwards launched from the top of the gliding hill and made several free flights down the hill of about 30 yards. The construction of the glider is now advancing well, two of the wing frames being nearly completed.

It is probable that the club's ground at Billesley Farm, early next year, will assume much greater importance from a flying point of view, as it is likely one of the club members will be putting up a hangar and workshop there large enough to house more than one aeroplane. He has spent several weeks at Hendon so as to obtain a considerable knowledge of aeroplanes with a view to starting a company at Birmingham.

On Saturday last, in spite of the wretched weather, Mr. W. Lunn obtained some improved results from his model, which occasionally covered a distance of about 200 yards. Master Jones was also getting some excellent flights with his "W.H.C." monoplane.

The next day Mr. J. Baker was rather unfortunate in breaking his 6 ft. model which had previously given some excellent flights, and Mr. G. Haddon Wood made some improved trials with his modified model, while some fine flights with Mr. E. Trykle's glider were obtained.

Members are reminded of the general meeting which takes place on Wednesday, January 3rd next at 9, Belgrave Road, at 8 p.m., and that the next quarter begins on January 1st, when all subscriptions should be sent to Mr. E. Trykle, 9, Belgrave Road.

Blackheath Aero Club (196, BROCKLEY ROAD, BROCKLEY, S.E.).

At the Kidbrooke Aerodrome on Saturday last, many members were tuning up in readiness for the "distance" and "point-to-point" competitions, but these had to be postponed, as the ground was more suitable for boating than model-flying. Good flights were made by Messrs. Brough, Ford, Whitworth, Pizey, Waghorn, and Egelstaff, and the 2½-oz. "Victor" monoplane, flown by Mr. Clark, was in fine trim, but none of the members deemed it advisable to go for distance, as it was very misty.

Messrs. Brough and Clark were testing their machines on Blackheath, and later, accompanied by Messrs. Pizey and Waghorn, they achieved numerous flights at the Lee Aerodrome. Spectators and members were few in number as it poured with rain during the practice at this ground.

Three new "tractors" appeared this week-end, but these are not tuned up yet.

Members are expected in full force at the Central Hall, High Street, Peckham, on January 4th, at 8 p.m., when the club will hold its first Exhibition, and judging from the reports to hand there should be a very representative collection of models, &c.

The committee also expect that one or two miniature engines suitable for model aeroplanes will be on view. Further details will be supplied on application to the hon. secretary at the above address.

Brighton and District Model Ae.C. (36, LITTLE PRESTON ST.).

A SPLENDID afternoon's flying was obtained at Shoreham Aerodrome on Saturday last, although Mr. Burghope was away giving exhibition flights in Warwickshire with his giant machine. Mr. Hervey, who joined during the afternoon, made some splendid flights with his Mann monoplane, although it persisted in circling. Once it landed on the roof of one of the hangars, but was rescued through the kind assistance of an employee of the Chanter school. The way he crossed the gabled roofs composed of corrugated iron, slippery with frost, was nothing short of remarkable. Mr. Orford did long straight flights. Mr. Knowles at first had no success, but by dint of tuning his flights steadily increased. Mr. A. von Wichmann had his old certificate machine out and was



A group of members of the Blackheath Model Aero Club, which is doing such consistently good practical work in the model world.

trying to induce it to fly straight, with no avail; although he got a flight of 280 yards, all thanks to the gentleman who took such an interest in the models and who assisted in the task of holding the winder. At the general meeting on December 21st it was decided to hold an open point-to-point competition on January 13th at the Brighton-Shoreham Aerodrome, weather permitting. It is hoped that this will meet with good support both from outsiders as well as members. For full particulars apply to the hon. sec., Mr. A. C. von Wichmann, Kingsleigh, Kingsway, Hove. There will be a general meeting at 36, Little Preston Street, on Saturday, January 6th, at 7.45 p.m., when the programme for the new year will be discussed. All desiring to join are invited. The club has the finest flying ground in the British Isles, perfectly flat, no trees, a maximum of fine weather. Flying on Saturday, December 30th, at Shoreham.

4th Clapham Troop Boy Scouts (Model Aeroplane Section) (65, NORTH STREET, CLAPHAM, S.W.).

ON December 9th the first meeting of the above was held, when Mr. W. J. Smyrk gave a lecture on the designs and construction of model aeroplanes for both flying and exhibition. There were three models shown, 1 Valkyrie racer, 1 Blériot 2-seater, (both exhibition models), and a Smyrk monoplane capable of 1,500 feet flight. A flight was attempted on Clapham Common, but the L.C.C. have prohibited model flying there. After the lecture the questions asked by the boys showed their keen appreciation.

Mr. Smyrk generously offered one of his models to the first member of the Troop to make and fly a model 125 ft., not a very difficult condition.

Coventry Aeroplane Building Society (22, KINGSTON ROAD).

A MOST enjoyable evening was spent on Tuesday, December 12th, when a lecture on "Bird Flight" was given by Mr. J. Liggins. Mr. Liggins has studied this subject for a number of years, and has constructed and experimented with various machines of the ornithopter or flapping-wing type, and the accounts of these experiments proved very interesting. The lecture was enjoyed by all present, and a hearty vote of thanks was passed to Mr. Liggins. A very interesting, and at times rather heated, discussion followed the lecture, and is to be continued on Tuesday, December 19th, in the workshop.

On Saturday, December 16th, there was some interesting flying at Birmingham Road. Ryley's single screw Shorter-Ryley monoplane put up some fine performances. This model is very stable and will fly in almost any wind. Overton's O.K. monoplane made several good flights. On one occasion this model came down with a crash from about 50 ft., and later charged a telegraph post while travelling at full speed. The only damage caused by both mishaps was a stretched wire, which speaks well for the workmanship and material of the model. Cobb's L.M. monoplane unfortunately "landed" in a tree after a splendid flight, and was only rescued after a hair-raising climb by its owner.

Dover and District Model Ae.C. (21, GODWYNE ROAD, DOVER).

The first general flying meeting of the above club was held on Saturday last and proved very successful. The best flights of the day were made by Messrs. H. Warwall (twin-screw monoplane of his own design and construction), H. D. Davis (twin-screw monoplane designed and built by himself), E. N. Joyce (No. 3 "Aerial," from the Aerial Engineering Works, Balham), and A. G. Wicks (single-screw home-made monoplane). The flights ranged from 300 yds. to $\frac{1}{4}$ mile. During the next few weeks the club have arranged flying meetings for Wednesday and Saturday afternoons (weather permitting). Anyone wishing to join the club should communicate with the hon. secretary, H. D. Davis, 21, Godwyne Road, Dover.

City of Liverpool Aero Club.

THE City of Liverpool Aero Club (which was formed on December 14th) has decided to hold an exhibition of models early in January, when two cash prizes of 10s. each will be awarded as follows: Section 1, excellence of design and originality; Section 2, workmanship. The competitions are open, and there is no entrance fee. The subscription has been fixed at 5s. per annum, due on January 1st, and if not paid by the 31st inst. a fine will be imposed. The hon. sec. (*pro tem.*) is Mr. Robert N. Harrison, "Denehurst," Victoria Park, Wavertree.

Paddington & Districts Ae.C. (133, BUCHANAN Gdns., HARLES DEN).

AT the Club's private flying ground at Parkside, Sudbury, on Boxing Day, several members made informal flights. Mr. Hurlin tested a new member's model, which flew well but inclined to circle, and after many successful flights landed in the top of a tree. Mr. Evans had two machines out on their trial spins, the 6-oz. model was, however, underpowered, but his 4-oz. model flew exceptionally straight with no rudder, and covered about 400 ft. with the same number of turns on the elastic.

Further prizes have been put up for models constructed by

members, Messrs. Evans and Canning having offered a first prize of 10s. 6d. and second of 5s. for a biplane rising under its own power and flying greatest distance. The competition will be held in June, and full particulars will be posted in the club workshop.

On Wednesday, January 3rd, the second annual general meeting of this club will be held, thus inaugurating its third season. The secretary would be pleased to see every member turn up and incidentally to bring a prospective member with him. Subscriptions of 10s. 6d. carry membership with full benefits until December 31st, 1912. Monthly subscriptions of 1s. are due January 1st. Mr. Hurlin's lecture on "Constructional Details as applied to present day Models" takes place at the club workshop, Windsor Place, Harrow Road, Paddington, on Saturday, January 13th, and anyone interested is invited.

Scottish Ae.S. (Model Aero Club) (6, McLELLAN ST., GOVAN).

OWING to illness Mr. Phillips was unable to lecture to the members last Friday, so the evening was spent in discussing the various suggestions put forward for the monthly competitions and club championships. On Saturday there was a fine turn-out of members at Ibrox and some brilliant flying was seen.

The "Mann" type monos. of Messrs. Balden and Langlands lived up to their reputation. Mr. Graham's model made a flight of about 900 ft., which is extremely good considering the cramped nature of the flying ground. Mr. Mills' model showed fine duration and Mr. Boyd's baby model caused no little amusement. Mr. Gordon's model with main plane closely resembling that of the Etrich monoplane made some flights of about 40 secs. duration. This model is a very slow flier, no doubt owing to its huge area and negative angle of incidence at rear wing tips *a la* Etrich.

When darkness had fallen sparklers were fixed to the models of Messrs. Balden, Graham and Gordon, and some beautifully illuminated flights were made. The club will travel to Barrhead on New Year's Day, by the 10.20 a.m. train from Central Station, and a large turn out of members and friends is requested.

The next lecture will be given by Messrs. Donaldson and Mills in the Institute, Elmbank Crescent, Glasgow, on Friday, January 12th, 1912, at 8 p.m., and the subject for discussion will be "Propellers." All interested are cordially invited. There will be flying at Ibrox every Saturday until further notice.

Stony Stratford & District Kite & Model Ae.C. (OLD STRATFORD)

A GENERAL meeting was held on Dec. 21st, at 8 p.m., at the clubroom, but owing to the holiday rush only half-a-dozen members were present. The minutes of the previous meeting were read and confirmed. Correspondence from Mr. Grimmer and the Conisborough Aeroplane Society was read, and the idea of granting certificates for model performances was discussed, but it was decided to let the matter stand over for further consideration later. Messrs. C. C. Allport and J. I. Webster, of the Conisborough and District Aeroplane Society were unanimously elected honorary members. The matter of affiliation was again brought forward, and it was decided to let it stand over till a later date. Owing to the unfortunate illness of Mr. Moore who had kindly promised to address the members a general discussion was held. The next meeting to be held on January 4th at the club room at 8 p.m., when Mr. O. Hamilton, senior, will give an address entitled "Experiments and how to make them." The secretary hopes there will be a good attendance at this the first meeting in the New Year. There is nothing to report from the club ground owing to the wind and rain having the upper hand.

Palmer's Green and District Model Ae.C. (15, MOFFAT RD., N.)

ON Saturday the club held a successful meeting at Powys Lane. The weather was dull and inclined to rain, but some good flights were made. Mr. E. Brown was responsible for some good work with his 3 ft. and ounce models, the former making a duration of 45 secs. on one occasion. Both models, however, tended to circle, and for that reason no long flights were registered. Mr. J. McBirnie, whom we are pleased to welcome as a new member, gave us a demonstration with his light models which proved very buoyant in gusty circumstances. We shall, of course, have plenty to say about him in the future.

Mr. R. L. Roger's Mann model, which he had hurriedly assembled, flew well, although it was evident by the erratic course it steered that the model needs "knowing." Mr. Lingard's Mann monoplane was doing some good flying, and he should do great things later on. Mr. Trollope's machine was also going strongly, and is evidently improved by new propellers. The coaxing way in which he talks to his machines evidently seems to do great things for them. Mr. A. Roger's "dart" was still going strong. Its flying showed that neatness was not its only qualification, some good flights being made when the fence remous were surmounted. Mr. B. Brown left his model behind this week and turned up with a large kite, which he soon got up to a considerable altitude with the aid of a small black dog, who insisted on seizing the cord.

FOREIGN AVIATION NEWS.

New World's Distance Records.

THE approach of the end of the year and the consequent closing of the 1911 competition for the Ae.C.F. Criterium, under practically the same rules as the Michelin Cup used to be competed for, witnessed some determined attempts to wrest the honours from M. Fourny. A successful attempt was made on Sunday last at Pau by Gobe on a Gnome-engined Nieuport monoplane, when he succeeded in covering 740.255 kiloms. in 8 hrs. 16 mins., thus improving on the world's distance record of Fourny of 722.93 kiloms., for which the time taken by the Maurice Farman biplane was 11h. 1m. 29½s. Gobe's Nieuport machine carried at the commencement 260 litres of petrol and 65 litres of oil as sufficient supply for eleven hours.

Testing the R.E.P. Monoplane.

IN the presence of Col. Bouttieaux, some extraordinary tests were carried out at Buc with a R.E.P. monoplane the other day. A machine was turned upside down, and mounting the fuselage on trestles, the wings, unsupported, except at the tips, were then loaded with sand until they carried 6,250 kilog., representing a little over 6 tons, or a loading of 320 kilog. to a square metre before the framework gave way.

A Storm at Chartres.

Extensive damage was done by storm at Chartres on the 21st inst., when several hangars on the flying ground were blown down on top of the machines they were housing, pretty badly damaging them.

More H. Farman Machines for French Army.

ON the 21st inst., Capt. Destouches visited the Farman works at Mourmelon and formally accepted delivery of five new biplanes, after witnessing them being tested by Fischer, Gugenheim and Beaud.

At the Maurice Farman School.

ON the 21st inst., Lieut. Reynaud and Lieut. Lucca were both flying over the country round about Buc, the latter being up for an hour and a half. Lieut. Noe was also in the air for an hour, and carried several passengers, while Lieut. Battini was flying over St. Germain, St. Cyr, and Versailles with a passenger.

A Sommer Military School.

IN view of the increasing number of pupils attached to the French Army, M. Sommer has decided to start a military school, and has made arrangements with M. Paulhan to share his ground at St. Cyr. The new school will open on Monday next.

From St. Cyr to Vidamee.

ALTHOUGH the conditions were by no means favourable, Lieut. Gaubert set out on the 19th inst., on his Borel monoplane, to fly to

La Vidamee. He made the journey in 40 mins., having lost a little time on the way owing to his getting lost in the fog, and making a detour to the North before being able to pick up his bearings again.

Aviation and Music.

A NEW cantata "Aux Aviateurs," which has been composed by M. Saint-Saens as a test piece for choral societies taking part in the International Music Festival to be held at Paris next May, will be awaited with great interest by those who have any concern with flying machines.

From Rheims to Vincennes.

ON the second Maurice Farman biplane which took part in the military competition at Rheims, and accompanied by a couple of friends, MM. Carpentier and Georges, Renaux on the 20th inst. set out to fly back to the Farman works at Buc. He was, however, overtaken by night, and so landed at Vincennes, but otherwise the journey was without incident.

German Wireless Telegraphy Experiments.

DURING the past few days a series of experiments in wireless telegraphy have been carried out by Albert Rupp. With the aid of a passenger, on the 11th inst., when flying over Johannisthal Aerodrome, at a height of 150 metres, he found it possible to communicate with several stations set up at Berlin and in the suburbs.

German Events for Next Year.

THE North German Aeronautic Society is endeavouring to arrange a comprehensive series of competitions to take place next June. The idea is to have a week's flying at Kiel, and then to fly across country from point to point. At Kiel there would be competitions for Military and Naval aeroplanes; the Military competitors having to land on different kinds of ground, then dismantle the machine and transfer it to another point, and restart; while the Naval tests will probably consist of dropping bags of sand on to the deck of a cruiser in Kiel Harbour.

An Aeroplane for German Museum.

THE Rumpler monoplane, on which Hirth won the prize of 50,000 marks by a 702 kilometre flight from Munich to Berlin, has just been presented by him to the German Museum at Munich, where it will no doubt be treasured in the years to come.

A Relief Fund for German Aviators.

The Society of German Aviators has decided to start a fund with the object of helping those who are injured in accidents. All flying pupils and aviators residing in Germany will have to belong to it and pay a subscription, the amount of which has not yet been decided upon, as well as make over a certain percentage of their winnings to the fund.

A RIGHT MERRIE GATHERING AT EASTCHURCH.

AN event of considerable importance to the little community of Eastchurch took place on Tuesday evening last week when the Naval aviators gave a dinner to the employees of Messrs. Short Brothers. The dinner, which was given in the concert room of the "Crooked Billet" Inn, was attended by thirty-six persons in all, and went off with a swing which must have been highly gratifying to those who organised it.

After an excellent repast, various members of the party gave an impromptu entertainment, which revealed considerable vocal talent amongst the men, both in serio and comic songs, and which were rendered in a really delightful manner, the singers being Capt. Gerrard, R.M.L.I., Messrs. W. G. Bell, G. Sherborne, L. Warner, J. Smart, W. Millet, A. L. Owers, L. V. Burgess, and Mr. Oakes at the piano.

The members of the party were as under:—

Capt. Gerrard, R.M.L.I., Lieut. Samson, R.N., Lieut. Gregory, R.N., Mr. Horace Leonard Short, Mr. Oswald Short, Mr. J. L. Travers, Mr. R. Paterson, Mr. W. G. Bell, Mr. A. Chapman, Mr. R. Barrett, Mr. J. Smart, Mr. A. Owers, Mr. G. Sherborne, Mr. L. Warner, Mr. A. Adams, Mr. E. Pynn, Mr. A. Lock, Mr. E. Lark, Mr. A. Woollard, Mr. H. Lawson, Mr. E. Lowe, Mr. I. Watson, Mr. W. Millet, Mr. J. Streeter, Mr. F. Hayward, Mr. L. V. Burgess, Mr. J. Davison, Mr. G. Halsey, Mr. Oakes (Pianist), Mr. Dobson, Mr. A. Smith, and Masters Bell, Jun., Whittington, Downham, and Halsey, Jun. Lieut. Longmore, R.N., was unavoidably absent.

Although it was understood beforehand that speeches were barred, Lieut. Samson, the senior officer, who presided, could not escape the demands upon him for a few words, which led to a proof of that which is otherwise so much in evidence at Eastchurch, viz., the splendid feeling and co-operation which exists between the aviators and all who aid them in their aerial work. Mr. Horace Short replied, and was followed by Lieut. Gregory, R.N., who, by the way, had done a lot of spade work in connection with the dinner, and who in a short crisp speech laid stress upon the feeling of confidence which the flyers have in the work produced by the men at Eastchurch.

After several toasts had been drunk, none with more enthusiasm than that of Mr. Frank K. McClean, who, all regretted, was absent from Eastchurch, the evening was wound up with a vote of thanks to the Naval officers, admirably put by Mr. A. W. Bell, on behalf of the men present.

Simms Accessories in the Midlands.

FOR the convenience of their clients in the Midland district, the Simms Magneto Co., Ltd., will open a branch at St. Mary Street, Coventry, on Monday next. Large stocks of their various specialities will be carried to facilitate immediate delivery to customers in Coventry, Birmingham, and Wolverhampton. There will also be a staff of trained mechanics for the purpose of executing repairs on any type or make of magneto within twenty-four hours.

CORRESPONDENCE.

* * The name and address of the writer (not necessarily for publication) MUST in all cases accompany letters intended for insertion, or containing queries.

Correspondents communicating with regard to letters which have appeared in FLIGHT, would much facilitate ready reference by quoting the number of each letter.

The Filey Disaster.

[1451] On reading through Mr. Blackburn's account of the Filey disaster which appeared in FLIGHT, December 16th, it struck me that 18 tons pressure on the planes at the time at which they collapsed was rather on the large side, even for a dive of 550 ft. On working it out myself with data given by Mr. Blackburn, I get a very different answer. I might also point out in passing that 188.2 ft./sec. is, I think, a good deal nearer 128 m./h. than 142 m./h. which Mr. Blackburn makes it out to be.

Below I give my calculations:—

Final velocity $V = \sqrt{u^2 + 2gh}$
 u being initial velocity.

$$\therefore V = \sqrt{\left(\frac{65 \times 60}{88}\right)^2 + 2 \times 32.2 \times 550} \text{ ft./secs.}$$

$$= \sqrt{47384.26} \text{ ft./secs.}$$

$$= 193.35 \text{ ft./secs. or } 131.84 \text{ m./h.}$$

This, as you will see, is a good deal less than 207 m/h.

With this answer the total stress on the planes would work out to be between 6 and 7 tons, which, I think, is nearer the mark than 18 tons. My result is got by neglecting all friction with the air, which, if it were taken into account, would make the final result even smaller.

The very steep angle at which Mr. Oxley descended was not, I think, in itself very dangerous, as it can be easily shown that at whatever angle the descent be made the final velocity on flattening out will be the same in all cases, provided the height from which the descent be made be the same and the engine be cut off. Suppose the glide be made from a height h , and at an angle α , to the horizontal. The distance of the glide would be $\frac{h}{\sin \alpha}$, and

the component of g , acting in the line of flight, would be $g \sin \alpha$.
 \therefore the final velocity (disregarding initial velocity) would be $\sqrt{2g \sin \alpha \times \frac{h}{\sin \alpha}} = \sqrt{2gh}$, which would be the velocity attained

through falling from a height, h . This, again, is not altogether true in practice where the resistance of the air has to be taken into account, and is very considerable in some machines. All aeroplanes have a certain gliding angle, differing in different machines, at which they can descend with no acceleration. This state of affairs is only possible when the air friction is exactly equal to the component of g in the line of flight.

I think the actual danger comes in flattening out to the horizontal after a dive. The steeper the dive, the larger must be the angle through which the machine must be straightened out, and hence the greater must be the pressure on the wings if this evolution be carried out too quickly. If it be safe to flatten out through a certain angle, say, in 3 seconds, it seems to me that for twice the angle, if double the time be taken, there ought not to be any danger from the wings bursting.

Hendon

G. H. MAY

[1452] I was very much interested in Mr. Blackburn's letter under the above heading in your issue of 16th inst. As one whose knowledge of aeroplanes is simply that of a person residing in one of the houses adjoining the Brooklands Aerodrome, who consequently sees (and hears) them very frequently, I feel great hesitation in taking exception to anything written by so experienced and practical a man as Mr. Blackburn. I cannot, however, help pointing out that his calculations are faulty both in principle and in arithmetic.

Accepting all the figures with which Mr. Blackburn starts, and ignoring with him the resistance attributable to the planes and the rest of the machine, which towards the end of the dive would be very considerable, I should work out the figures as follows:—

$V^2 = v^2 + 2gh$ where v is the initial and V the final velocity.

$$= 65^2 + 2(32.2)550 \cdot \left(\frac{60}{88}\right)^2 \text{ m.p.h.}$$

$$= 4225 + 16466 \text{ m.p.h.}$$

$$V = 144 \text{ m.p.h. approximately.}$$

The velocity, therefore, at the time the machine was flattened out could not have been more than 144 m.p.h., while Mr. Blackburn makes it 207 m.p.h.

Mr. Blackburn then takes the formula $P = .003V^2$. This is, I believe, the National Physical Laboratory's formula for wind

pressures normal to a plane. In the present case, assuming the angle of descent to be that given by Mr. Hunt, namely 65° , the planes after the machine was flattened out would make an angle of not more than 70° with the direction of motion, instead of being normal to it. This would probably not, however, introduce an error of more than 10 per cent., so may be ignored.

$$\therefore P = .003v^2 \text{ lbs. per sq. ft.}$$

$$= .003(144)^2 \text{ „ „ approx.}$$

$$= 61 \text{ „ „}$$

$$\text{Area of planes} = 290 \text{ sq. ft.}$$

$$\text{Pressure on planes} = 17,980 \text{ lbs.}$$

$$= 8 \text{ tons approximately.}$$

I have ventured to go a little further than Mr. Blackburn, and to consider what pressure on the planes would have been necessary to destroy the vertical velocity of the aeroplane, and to have prevented it from striking the ground had the planes not given way. The figures are rather surprising:—

R = total pressure on planes in lbs.

s = distance fallen through in ft. = 50.

m = weight of machine in lbs. = 1,350.

u = velocity on reaching ground = 0.

f = retardation in ft. per sec.

v = vertical velocity at time of accident.

$$= 144 \times \frac{88}{60} \times \sin 65^\circ.$$

$$= 211.2 \sin 65^\circ.$$

$$v^2 = u^2 + 2fs \quad \therefore f = \frac{v^2 u^2}{2s} = \frac{\{211.2 \sin 65^\circ\}^2}{100}$$

$$R - \text{Wt. of machine} = \frac{mf}{s} = \frac{(211.2)^2 \sin^2 65^\circ \times 1350}{100 \times 50} \times \frac{1}{2240} \text{ tons} = 7 \text{ tons}$$

nearly, showing that an average vertical thrust of $7\frac{1}{2}$ tons on the planes would have been necessary to prevent the machine striking the ground, whereas the pressure on the planes at the time of flattening out the machine was not more than 8 tons, and this would have considerably diminished as the velocity decreased. From this it is evident either that an accident was inevitable at the moment the machine was flattened out, or that the resistance due to the air must have prevented the machine from attaining anything like the speed of 144 m.p.h. I do not know what the head resistance of the Blackburn monoplane is, but I doubt whether a speed of 144 m.p.h. would be attained, from whatever height the machine descended. Information on this point would be very interesting.

In conclusion, it appears probable that the accident was caused, not by the strain becoming too great for the planes generally, but through some part of the planes being subjected to an unduly great proportion of the strain consequent on the machine being suddenly flattened out.

Weybridge.

C. H. MAY.

The Aeroplane in War.

[1453] With reference to letter 1445. I am extremely sorry that "R.A." should have been given the trouble to reply to my last letter, the publication of which I endeavoured to stop.

However, the reply is apparently much what it would have otherwise been. In this letter I will try to be more explicit, and at the same time as brief as possible.

In the letter I endeavoured to substitute for the one published, I explained that "something similar to chain shot" would with modern ordnance probably take the form of a shell, sections of which opened radially on impact without becoming detached from a central stem, and the phrase so much objected to by "R.A." was intended to convey to readers who were not conversant with h.p., case, ring, shrapnel, &c., some shell or bullet, capable of inflicting greater damage on the class of target under consideration than its necessarily small size would otherwise effect. To make one's letters of general interest in return for space so generously given, and when challenged on a technical point to give a short technical answer should be the rule; and with this I am sure all your correspondents will agree.

"R.A." is evidently under the impression that a knowledge of gunnery is all that is required, and that my knowledge of that subject is of the most elementary description. Therefore, I must state that I have a fair knowledge of gunnery, a good knowledge of aeroplane construction, a slight knowledge of tactics, and a little common sense.

My gunnery, which he evidently doubts most, enables me to thoroughly appreciate the nature and position of my target, to consider the best angle of attack and defence, to take into con-

sideration my target's weak points, and the protection that will be given to it in the way of armour-construction gives me the amount of lift available, and indicates at once the small margin I have to work upon. Gunnery, again, gives the most effective gun for that weight, the greatest range I can hope to attain, and the nature of the shell it would be best to use. Common sense clearly points out that to divide my small surplus lift, to enable two arms to be carried, one of which is entirely useless against my chief enemy, would be more than foolish. My gunnery enables me to say that in spite of the unstable platform better practice can be made with a gun than with a bomb tube. In saying this I do not overlook the nature and position of my target and the angle through which the gun can be effectively used, this is what our gallant gunner has done, but it should be the first consideration of any practical gunner.

I am sorry "R.A.'s" "definite opinion" is so much at variance with all other expert opinion, and that he still thinks a machine gun with a necessarily large quantity of ammunition, together with a 20 to 30 pound bomb tube, and, I suppose, 100 to 200 pounds of bombs is a better equipment for an aeroplane scout, whose chief duty is scouting or destroying similar scouts to be found in the same horizontal plane, than a gun slightly heavier than the machine gun, having a proportionally greater range and more effective shot.

The best answer to the gun v. bomb-tube argument is to be found in the Aeronautical Society's discussion. The bomb-tube, with or without its gymbals and sighting apparatus, has not been mentioned, nor is it likely to be. The reason is not far to seek, apart from weight, &c. It is to be found under the same heading as why gunners do not carry rifles. Therefore, until the aeroplane becomes a weapon of offence, we are wasting both time and valuable space in discussing it.

The mistake of trying to arm aeroplanes with guns and ammunition already in existence, simply because they are in existence, instead of recognising at once that the new branch demands a special gun and ammunition, is a very common one, and a discussion on the exact type of gun, ammunition for that gun, gun mounting, gun's position, armour, and their relative proportional weights, may not only be of the greatest assistance to constructors, but of the utmost importance to the nation. "Shrapnel," which seems to punctuate "R.A.'s" letter, and which is mentioned in no other so far as I can trace, will be found next to useless against aeroplanes, for unless the fuze can be set after the shell is in the bore the aeroplane's range may have varied to such an extent that it will be necessary to again find the range and reset the fuze. I am conversant with all modern T. fuzes, range and position finders, and the time under service conditions that is taken in their use, also the time it takes to complete the loading after the fuze has been set, and know of the special arrangements taken against cavalry travelling at a comparatively low speed. I say this to prevent any argument under this head. "R.A." must admit that with light armour over the vital parts the maxim stands small chance of disabling an aeroplane. We have seen one return in actual war with several bullet holes and a broken rib.

I presume I must take the last sentence of his letter seriously; in doing so I join him, in "correspondence on aerial matters just now, &c.," and state that I do not forget "that clouds and fogs do provide cover for aeroplanes when scouting." A London special, would no doubt prove most useful when the enemy hove in sight. I am afraid his knowledge of scouting in general and aeroplane scouting in particular, is, to say the least, rather vague. Is he under the impression that one can dodge in and out of a fog at will, or is he of the opinion that pilots and observers in aeroplanes receive some optical blessing which enables them to see through a fog or cloud to gain the information they are seeking.

Hassocks.

FRANK W. B. HAMBLING.

Normal Pressure.

1454] In a recent article on "Air pressure on plane surfaces moving normally," it is stated that "the total air-pressure on very small surfaces is diminished because no zone of negative pressure can exist behind them." This statement is surely incorrect, since Dr. Stanton's experiments on surfaces 3 ins. by 1 in.—which appear small enough—indicate a considerable negative pressure at the back of the plate and relatively almost as great as for very large surfaces. It is extremely probable that if experiments on similar plates were carried out at "corresponding speeds," it would be found that the ratio of the negative to the total pressure is the same for all sizes of plates.

The article appears to attach great importance to Eiffel's experiments on falling plates. These it must be remembered were moving not at constant velocity but with large acceleration, and the effect of this is that the value of k obtained will be greater than if moving at a constant velocity. Thus for a square plate of area $\frac{1}{4}$ sq. metre—the only size of plate common to the two methods of Eiffel—the constant determined by the chute method is '07 as com-

pared with '067 by the artificial air current. For larger plates the difference should be increased.

Eiffel's chute experiments show very clearly that for the same plate the value of k decreases as the velocity increases, a point not mentioned in the article.

Upper Tooting.

A. W. JOHNS, R.C.N.C., M.In.N.A.

Model Petrol Engines.

1455] In an article under the heading of "Models" in FLIGHT, No. 155, you mention a model driven by a small petrol engine as being the only one to your knowledge that has flown. It will probably be of interest to many of the readers of FLIGHT to hear that we have a model that, during the last year, has made over 50 splendid flights. The greatest stumbling block to experimenters in these large models appears to be the motor. We have had several of the best makes of motors, but none of these gave the required results. The motor with which we have had so much success was designed by our Mr. Mayer, and built at our works to the order of one of our customers. The engine weighs $8\frac{1}{2}$ lbs., and develops $1\frac{1}{2}$ horse-power at 1,500 r.p.m. The carburettor, a very troublesome item of these small engines, is of the wick type, of special design. A single coil and distributor is used. The model, ready for flight, weighs from 36 to 45 lbs., and is a monoplane of the O-1-P-1 type. The propellers used range from 32 ins. to 40 ins. in diameter, and from 2 ft. to 4 ft. 6 ins. pitch. To control the length of flight we have a time mechanism which retards the ignition. The altitude record of this model is 35 ft., and the distance $\frac{3}{4}$ of a mile, the limit of our aerodrome. We have several sets of planes for this model, making up into various spans from 9 ft. to 14 ft.

The objects of these experiments have been to obtain stability and weight lifting. No effort has been made to cut down the weight of the model, as it has to withstand rough usage. We hope at a future date to be able to give you the results of various flights, hoping they may be interesting to your readers; and should any of those wish to call upon the firm, Mr. Mayer will be pleased to afford all necessary information and explanations of detail, or will answer any letters on the subject addressed to the firm.

97, New Oxford Street, W.

J. BONN & CO., LTD.

Aeronautical Patents Published.

Applied for in 1910.

Published December 28th, 1911.

27,871. E. SPARMANN. Steering and balancing.

28,418. C. ZOLLER. Automatic stability devices.

Applied for in 1911.

Published December 28th, 1911.

2,978. J. MARAVIGLIA AND H. BANZET. Parachute.

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